INDUSTRIAL MEDICINE *and* SURGERY

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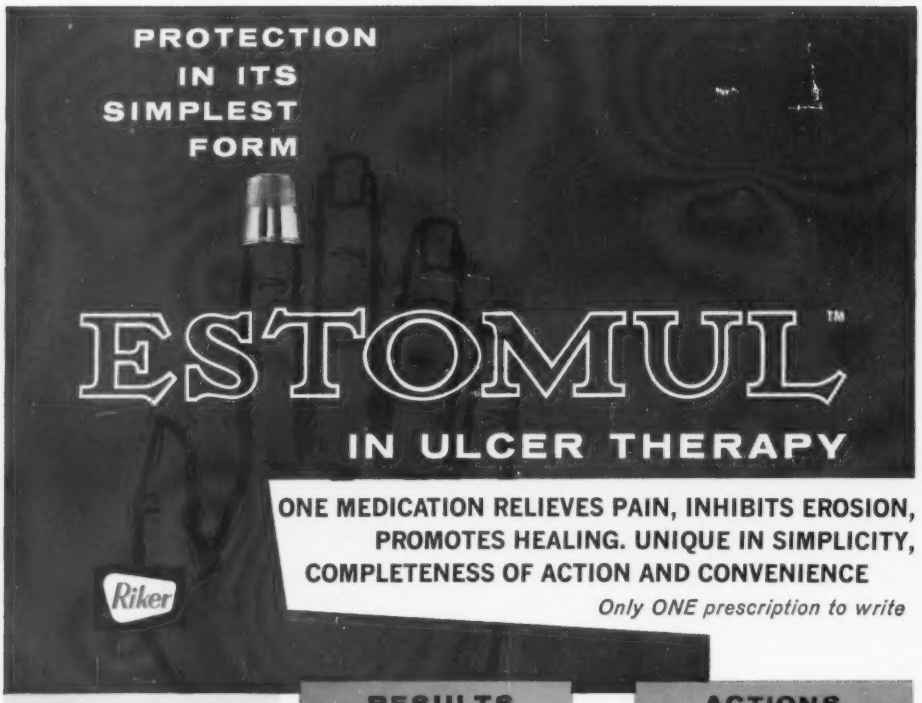

ONE MEDICATION RELIEVES PAIN, INHIBITS EROSION, PROMOTES HEALING. UNIQUE IN SIMPLICITY, COMPLETENESS OF ACTION AND CONVENIENCE

Only ONE prescription to write

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INDICATIONS:
Peptic Ulcer:
Duodenal Marginal
Gastric Esophageal
Hyperacidity and dyspepsia
Heartburn
Gastritis
Alcoholic gastritis
Gastroesophageal reflux
Esophagitis (without stricture)
Irritable bowel syndrome
Congenital shortening of esophagus
Chalasia of esophagus
Hiatus hernia of esophagus
Cardiospasm
Functional pylorospasm

DOSAGE:
Liquid and Tablets:
1 or 2 tablespoons or 1 or 2 tablets three times daily depending on severity of involvement.

SIDE ACTIONS:
Doses in excess of 6 tablets or 6 tablespoons daily may produce minor side actions such as dryness of the mouth or blurring of vision.

CONTRAINDICATIONS:
ESTOMUL should not be used in patients with organic pyloric obstruction or achalasia of esophagus. Use with caution in patients with renal impairment or insufficiency. Relative contraindications for anticholinergic drugs are glaucoma and prostatic hypertrophy which may lead to urinary bladder obstruction.

AVAILABILITY:
Tablets — Bottles of 100.
Liquid — Bottle of 12 fluid oz.

CAUTION: Federal law prohibits dispensing without prescription.

RESULTS

- RELIEVES SPASM AND REDUCES MOTILITY
- RETARDS ACID PRODUCTION
- PROMPT REDUCTION OF PAIN
- RAPID AND PROLONGED NEUTRALIZATION OF GASTRIC HYDROCHLORIC ACID TO DESIRABLE pH LEVEL
- COATS AND PROTECTS GASTRIC MUCOSA
- INHIBITS EROSION OF MUCOSA

ACTIONS

- ANTICHOLINERGIC
  orphenadrine hydrochloride
  ANTISPASMODIC
  ANTISECRETORY
- TOPICAL ANESTHETIC
  orphenadrine hydrochloride
- ANTACID
  aluminum hydroxide-magnesium carbonate co-precipitate
- DEMULCENT
  bismuth aluminate
- ANTIPEPTIC
  bismuth aluminate

FORMULATION

Each ESTOMUL TABLET contains:

orphenadrine HCl [2-dimethylaminoethyl (2-methyl-benzhydryl) ether HCl]	25 mg.
bismuth aluminate	25 mg.
magnesium oxide	45 mg.
aluminum hydroxide / magnesium carbonate co-precipitate	500 mg.

Each tablespoon (15 cc) ESTOMUL LIQUID contains:

orphenadrine HCl [2-dimethylaminoethyl (2-methyl-benzhydryl) ether HCl]	25 mg.
bismuth aluminate	50 mg.
aluminum hydroxide / magnesium carbonate co-precipitate	918 mg.

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INDUSTRIAL MEDICINE and SURGERY

ESTABLISHED 1932

The International Journal of Medicine in Industry

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BPA

PERSONAL NEWS AND NOTES

At the Industrial Hygiene Foundation 26th Annual Meeting: Philip Drinker, Professor Emeritus, Harvard School of Public Health (left); and Dr. H. H. Schrenk, Managing Director, Industrial Hygiene Foundation.

BLAINE B. WESCOTT, Vice President-Research, Gulf Oil Corp., has been named Chairman of the Board of Trustees of the Industrial Hygiene Foundation.

DR. WESCOTT succeeds DR. WILLIAM P. YANT, Research Consultant to the President of Mine Safety Appliances Co., who has served as Foundation Chairman since 1958.

The announcement was made by DR. H. H. SCHRENK, Managing Director of the Foundation, who also announced the election of PROF. THEODORE F. HATCH as Treasurer. MR. HATCH is Professor of Industrial Health Engineering at the University of Pittsburgh School of Public Health.

Both DR. WESCOTT and PROFESSOR HATCH have been trustees of the Industrial Hygiene Foundation for several years, and PROFESSOR HATCH is presently its research adviser.

Blaine B. Wescott, Ph.D.

Industrial Hygiene Foundation observed its 26th Annual Meeting at Mellon Institute, Pittsburgh, on October 25 and 26, 1961.

According to DR. H. H. SCHRENK, Managing Director of the Foundation, problems of the space age, the cold war, and the exploding population have made the public apprehensive about its future health and well-being. Radioactive fallout, air and water pollution, food additives, and even the exotic hazards of outer space have combined to work on the public's nerves to the extent that emotion has displaced logic. The result is exaggeration, misinformation, and demands for regulations and controls of hazards that may not be hazards.

That these problems are receiving the attention of research and management groups is evident from the broad scope of papers that were presented at the Conference.

Subjects that were discussed included the industrial use of x-ray and radioisotopes, plasma torch for producing unusually high temperatures, plastics and resins, health and safety problems in mines, labeling of hazardous substances, mental health, air pollution, electrostatic precipitation and ventilation for dust control, toxicity of chlorinated hydrocarbon solvents, and ozone, flame ionization detector for air contaminants, pulmonary function tests, cancer, pneumoconioses, and various problems concerned with workmen's compensation.

LEMUEL C. MCGEE, M.D., F.A.C.P., Medical Director of Hercules Powder Co., Wilmington, Delaware, has completed a one year term as President of the Delaware State Medical Society. DR. MCGEE is a member of the Industrial Medical Association Standing Committees on Education and Training, and Industrial Hygiene and Clinical Toxicology.

Three new staff appointments have been made in the Division of Occupational Health, Public Health Service. W. CLARK COOPER, M.D., has been named Deputy Chief of the Division; AUSTIN HENSCHEL, Ph.D., has been appointed Chief of the new Physiology Section; and OTTO A. BESSEY, Ph.D., has assumed the position of Chief of Research and Training Grants.

DR. COOPER will continue to serve also as Chief of Program Planning and Analysis, with responsibility for evaluating the Division's program in relation to major worker health problems, industrial trends, and manpower resources and facilities.

Under DR. HENSCHEL the Physiology Section, located at the Occupational Health Research and Training Facility in Cincinnati, Ohio, will investigate the physiologic effects of stressful factors in the industrial environment on the health and well-being of the worker. Studies will include effects on pulmonary function, fatigue, cellular defense, physical and mental work capacity, and tolerance to environmental extremes. Nutrition, aging, and mental health are other aspects that will be considered.

DR. BESSEY will be responsible for staff planning, direction, and administration of the Division's research grants program. He will provide consultation in the preparation and submission of research grants applications, as well as guidance in the development of projects in a broad range of scientific disciplines.

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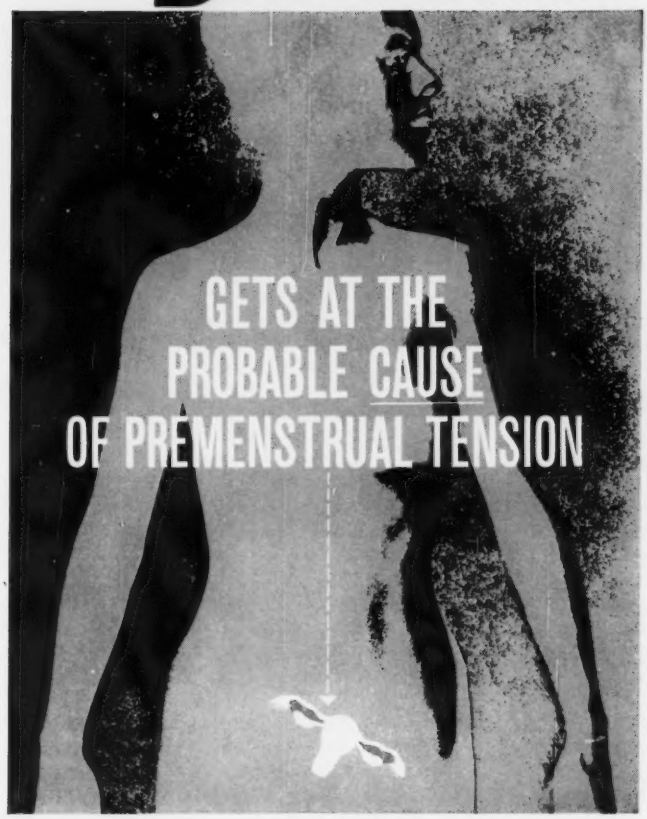

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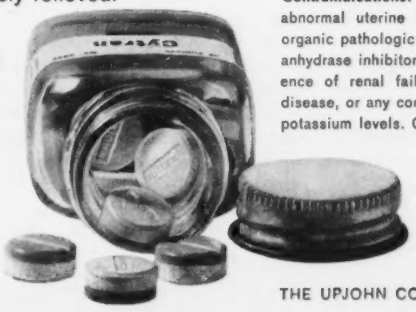

Each tablet contains:

Provera (medroxyprogesterone acetate)	2.5 mg.
Cardrase (ethoxzolamide)	35 mg.
Levanil (ectylurea)	300 mg.

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DR. COOPER joined the Division in 1952 as Chief of the Occupational Health Field Headquarters in Cincinnati, Ohio. Prior to that time he was Assistant Chief of Medicine at the Public Health Service Hospital in San Francisco.

After receiving his medical degree from the University of Virginia in 1934, DR. COOPER continued his studies in internal medicine and nutrition, and later did extensive work on the chemotherapy of malaria at the National Institutes of Health. In 1958 DR. COOPER received a master of public health degree *magna cum laude* from the Harvard School of Public Health. He is certified by the American Board of Internal Medicine.

DR. HENSCHEL was formerly Chief of the Environmental Protection Research Division of the Army's Quartermaster Research and Engineering Command. Previously he had served as Research Director of the Quartermaster Climatic Research Laboratory. He was on the faculty of the Physiology Department at the University of Minnesota Medical School and School of Public Health for 12 years, and since 1953 has been a visiting lecturer at the Harvard School of Public Health. A graduate of the University of Minnesota, DR. HENSCHEL received the B.S. and M.A. degrees in zoology and his Ph.D. in Physiology.

DR. BESSEY also comes to the Division from the Quartermaster Research and Engineering Command Laboratories of the Army, where he was Associate Chief of the Environmental Protection Research Division. Earlier he was Professor of Biochemistry and Nutrition at the Universities of Texas and Illinois and was on the staff of the Departments of Pathology and Biochemistry at the Harvard Medical School and the Harvard School of Public Health. He has also served as Director of the Health Research Institute of the City of New York.

DR. BESSEY received his bachelor's degree from Montana State University and his Ph.D. from the University of Pittsburgh.

Herman J. Bennett, M.D.

HERMAN J. BENNETT, M.D., has been appointed Medical Director of the Wilmington, Delaware, plant of the Buick-Oldsmobile-Pontiac Assembly Division of the General Motors Corporation.

DR. BENNETT was graduated from New York University with a B.S. degree and received his medical degree from the University of Vienna in 1936. He interned at the Bushwick Hospital in Brooklyn, New York, and was a resident at the United States Public Health Service Hospital in Lexington, Ky.

DR. BENNETT was on active duty with the Army of the United States from 1942 to 1946. After separation from service, he attended Columbia University and received his M.P.H. degree in 1947. From 1947 to 1956, he served as an Associate Physician with the New York State Department of Labor, Workmen's Compensation Board. His major activities were in the fields of occupational diseases and toxicology. During this period DR. BENNETT was also on the staff of the Adult Cardiac Clinic, Work Classification Unit, Bellevue Hospital. From 1949 to 1958 he was a lecturer in Occupational Medicine in the Department of Preventive Medicine, New York Medical College.

DR. BENNETT is certified in Occupational Medicine by the American Board of Preventive Medicine. He is a Fellow of the American College of Preventive Medicine, the American Academy of Occupational Medicine, the Industrial Medical Association, and the American Public Health Association. He is Chairman of the Emergency and Disaster Planning Committee and a member of the Committee on Problem Drinking of the Industrial Medical Association.

From 1956 until he joined the Buick-Oldsmobile-Pontiac Assembly Division of General Motors, DR. BENNETT was the Medical Director of the Poughkeepsie, New York, plant of the International Business Machines Corporation. He was also on the consulting staff of Vassar Hospital as a consultant in Preventive Medicine and Occupational Medicine.

The Ramazzini Society assembled for its Annual conclave at Sun Valley in Idaho on October 6, 7, and 8, 1961. The Ramazzini servants in charge for the year were DRS. ALLAN J. FLEMING and ROBERT B. O'CONNOR. The servants placed in charge of the 1962 meeting are DRS. WILLIAM F. ASHE and LEO WADE. The Annual Ramazzini Oration for 1961 was delivered by DR. L. E. HAMLIN. This Ramazzini Oration will appear in the January, 1962, issue of this Journal.

"Psychiatry and Occupational Medicine" will be the theme of the fifth annual seminar for occupational physicians to be held January 8-12, 1962, at The Menninger Foundation and the Topeka State and VA Hospitals, Topeka, Kansas. The seminar is designed to further the development of a psychiatric frame of reference applicable to the daily practice of the occupational physician, and it will consist of three major units: Psychodynamics or Basic Theory of Psychological Motivation, Principles of Psychiatric Examination, and Psychiatric Treatment. Enrollment will be limited to 20 physicians.

For further information write HARRY LEVINSON, Ph.D., Director, Division of Industrial Mental Health, The Menninger Foundation, Topeka, Kansas.

American Academy of Occupational Medicine will have its annual meeting February 7 to 9, 1962, at the Pittsburgh Hilton Hotel, Pittsburgh, Pa.

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1. Barden, F. W., et al.: J. Maine M. A. 46:99, 1955.
2. Ford, R. A., and Blanchard, K.: Journal-Lancet 78:185, 1958.

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PAUL J. WHITAKER, M.D., Secretary, announces that there will be scientific sessions on "Executive Health Examinations," GEORGE F. WILKINS, M.D., Chairman; "Hematologic Injury," WILLIAM F. ASHE, M.D., Chairman; "Cardiac First-Aid," JOHN L. NORRIS, M.D., Chairman; and "What Does Psychology Do for Industry?" ROBERT B. O'CONNOR, M.D., Chairman. ROBERT J. ANDERSON, M.D., will deliver the Gehrmann Lecture.

Tours are being arranged of the Aliquippa Works, Jones & Laughlin Steel Corp., by JOSEPH L. TAUBER, M.D.; of the Westinghouse Test Reactor Center, by ALBERT A. SPRITZER, M.D.; and of the Department of Occupational Health of the University of Pittsburgh Graduate School of Public Health, by ADOLPH G. KAMMER, M.D.

DON FOWLER, former Chief of Industrial Hygiene for the Chrysler Corporation, has joined the Lead Industries Association. MR. FOWLER will succeed the late MANFRED BOWDITCH as the Association's Health and Safety Director. He will be responsible for the continuing program of Lead Industries Association for gathering data and assisting in the setting of standards and acceptable practices for the industrial and domestic use of lead and lead products. He will also direct the Association's activity in the several conferences, seminars, and publications which LIA sponsors or in which it participates. An important new phase of Lead Industries Association's industrial hygiene program will be initiated

Mr. Don Fowler

under MR. FOWLER'S direction. This will concern several of the more recent developments in lead technology such as lead and leaded products for the control of radiation hazards and the use of lead in noise and vibration control and abatement.

A graduate chemist, MR. FOWLER has been concerned with safety and industrial hygiene for the past 20 years. Prior to directing Chrysler's industrial hygiene program he was Regional Supervisor for the Michigan Department of Health, and still earlier was a member of the safety and industrial hygiene staff of the Employers Group Insurance Company.

Died

EMERY R. HAYHURST, M.D., Ph.D., 81, in Upper Arlington, Ohio, on October 17, 1961. DR. HAYHURST was associated with the Ohio Department of Health from 1913 to 1936 as director of occupational disease surveys, Chief of the Division of Industrial Hygiene, and Consultant in Occupational Diseases. His first major publication, *A Survey of Industrial Health Hazards and Occupational Diseases in Ohio* (1915), was used as a basic guide not only in Ohio but also in other states, and led to legislation which for the first time listed specific occupational diseases that should be compensable along with industrial accidents.

DR. HAYHURST taught at Ohio State University, from 1915 to 1931, as Assistant Professor and Professor of Hygiene, and Chairman of the Department of Public Health, and he was long associated with the U. S. Public Health Service as Special Instructor in Industrial Hygiene, Surgeon, Consulting Hygienist, and Special Consultant. He was a charter member of the American Association of Industrial Physicians & Surgeons (1915), and he was active also in the American Public Health Association, the American Medical Association, the Ohio State Medical Society, and the National Safety Council. His writings brought him national recognition; his *Industrial Health*, published in 1923, was one of the earliest texts in the field; and throughout the years he contributed a steady stream of monographs, chapters and sections on occupational health for year books and standard texts, and articles for medical journals.

This Journal, of which he was Associate Editor for many years, published a Profile of DR. HAYHURST in the April, 1959, issue (28:200, 1959).

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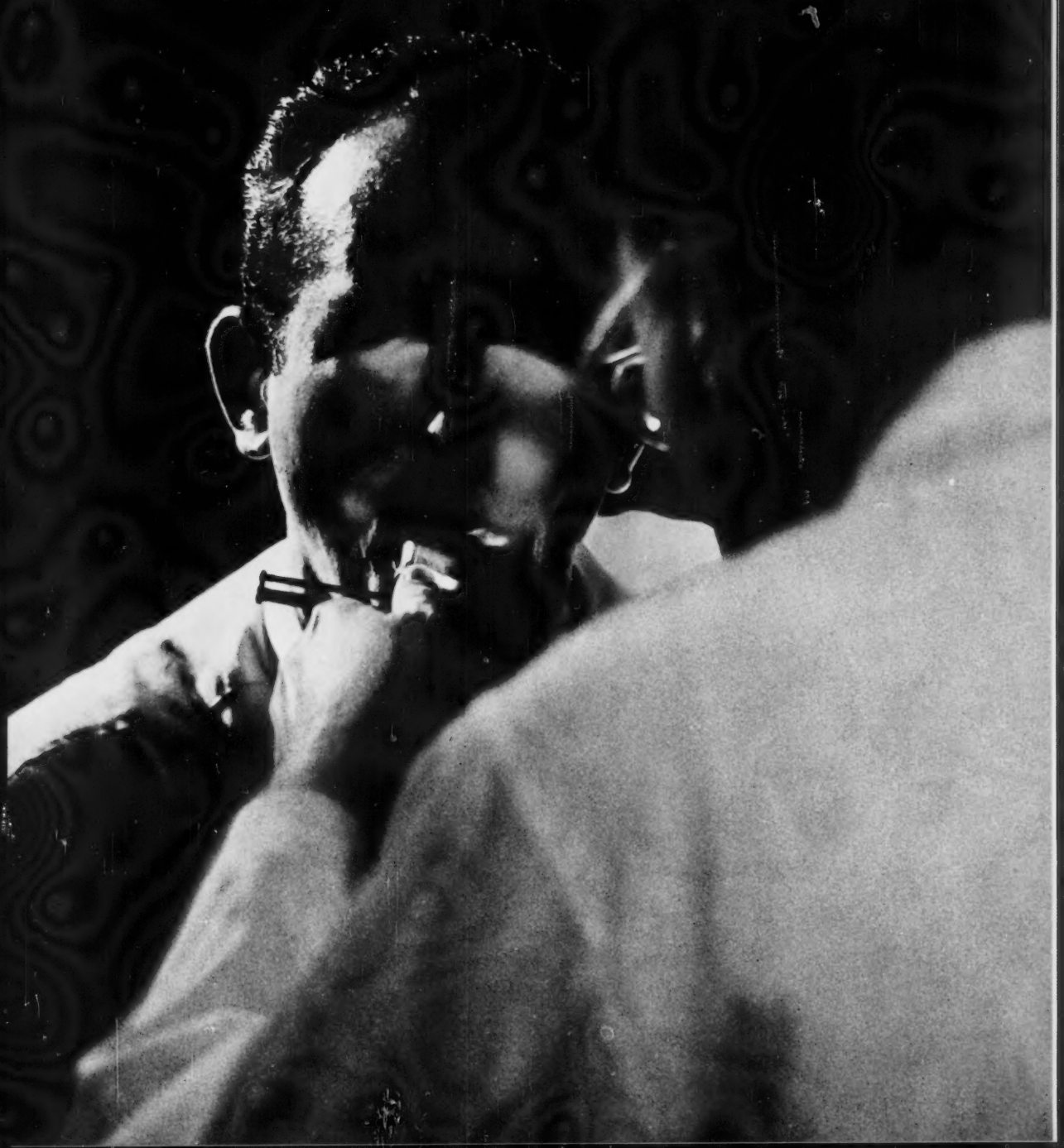
OXYTETRACYCLINE WITH GLUCOSAMINE

confirmed dependability in sinusitis is just one reason why



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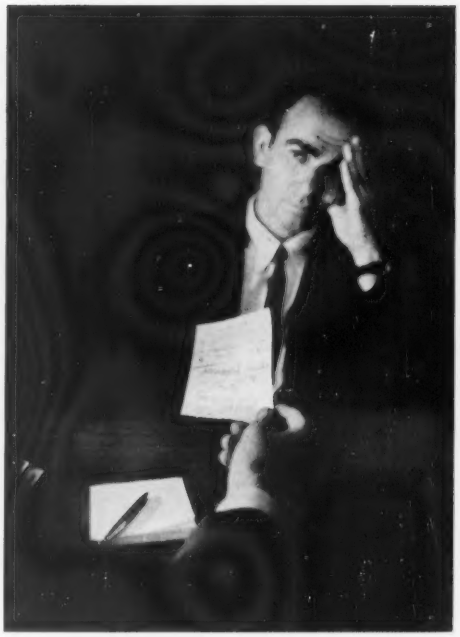

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The dependability of Terramycin in daily practice is based on its broad range of antimicrobial effectiveness, excellent toleration, and low order of toxicity. As with other broad-spectrum antibiotics, overgrowth of nonsusceptible organisms may develop. If this occurs, discontinue the medication and institute appropriate specific therapy as indicated by susceptibility testing. Glossitis and allergic reactions to Terramycin are rare. Aluminum hydroxide gel may decrease antibiotic absorption and is contraindicated.

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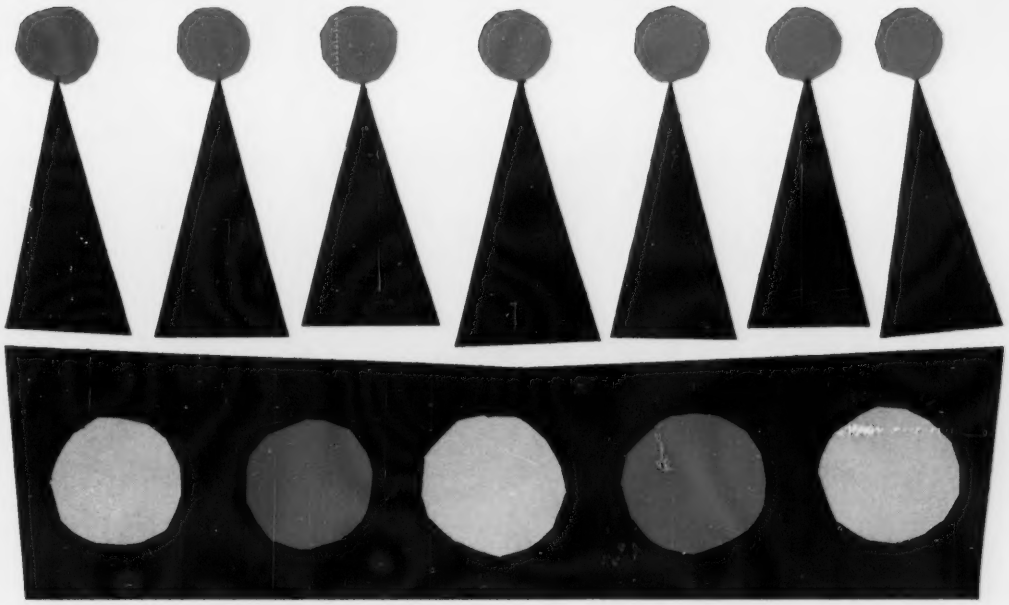
*Jacques, A. A., and Fuchs, V. H.: J. Louisiana M. Soc. 113:200, May, 1961.



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World Leader in Dermatologicals

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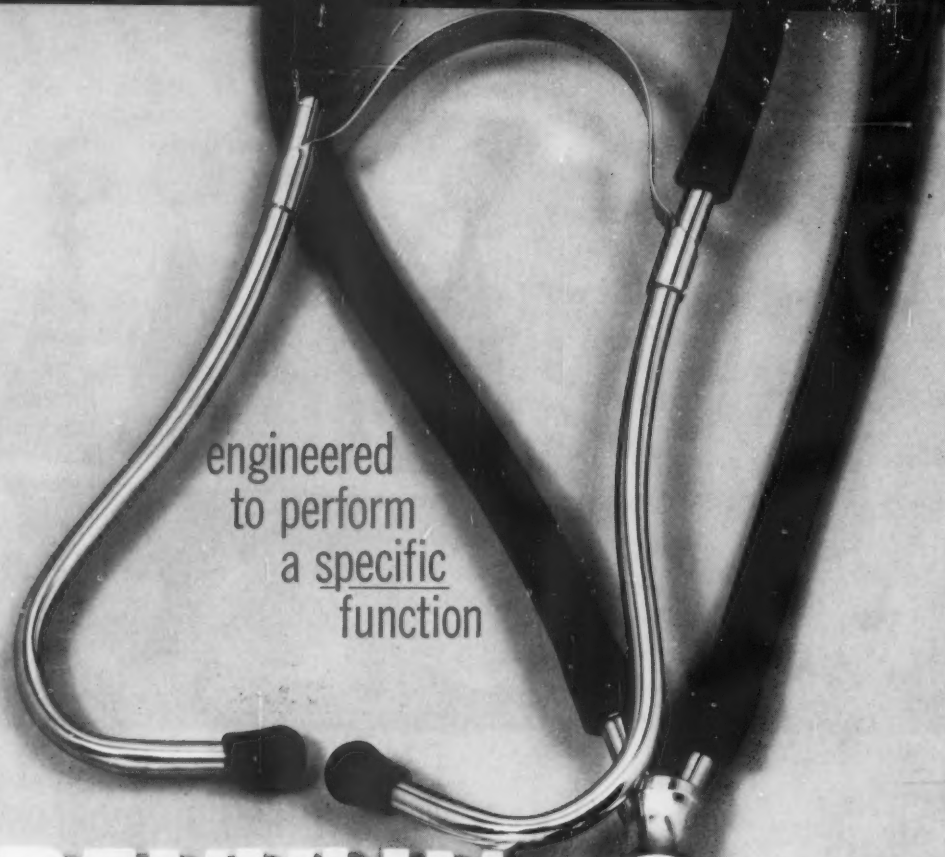

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specifically designed to help control cough

Just as a medical instrument is engineered for maximum efficiency in performing its specific function, BENYLIN® EXPECTORANT is formulated to provide effective relief of cough associated with colds or allergy.

The outstanding antitussive action of BENYLIN EXPECTORANT is attributed to a combination of carefully selected therapeutic agents. Benadryl,® a potent antihistaminic-antispasmodic, reduces bronchial spasm, quiets the cough reflex, and lessens nasal stuffiness, sneezing, lacrimation, itching, and other allergic manifestations. Concurrent respiratory congestion is relieved by expectorant agents that efficiently break down tenacious mucosal secretions. In addition, a demulcent action soothes irritated throat membranes. 59961

BENYLIN EXPECTORANT is a pleasant-tasting, raspberry-flavored syrup...completely acceptable to patients of all ages.

supplied: BENYLIN EXPECTORANT is available in 16-ounce and 1-gallon bottles.

Each fluidounce contains: 80 mg. Benadryl Hydrochloride (diphenhydramine hydrochloride, Parke-Davis); 12 gr. ammonium chloride; 5 gr. sodium citrate; 2 gr. chloroform; 1/10 gr. menthol; and 5% alcohol. *Indications:* Relief of coughs due to colds, other symptoms associated with colds, and coughs of allergic origin. *Dosage:* Adults—1 to 2 teaspoonfuls every three to four hours. Children—½ to 1 teaspoonful every four hours. *Precautions:* Products containing Benadryl should be used cautiously with hypnotics or other sedatives; if atropine-like effects are undesirable; or if the patient engages in activities requiring alertness or rapid, accurate response (such as driving).

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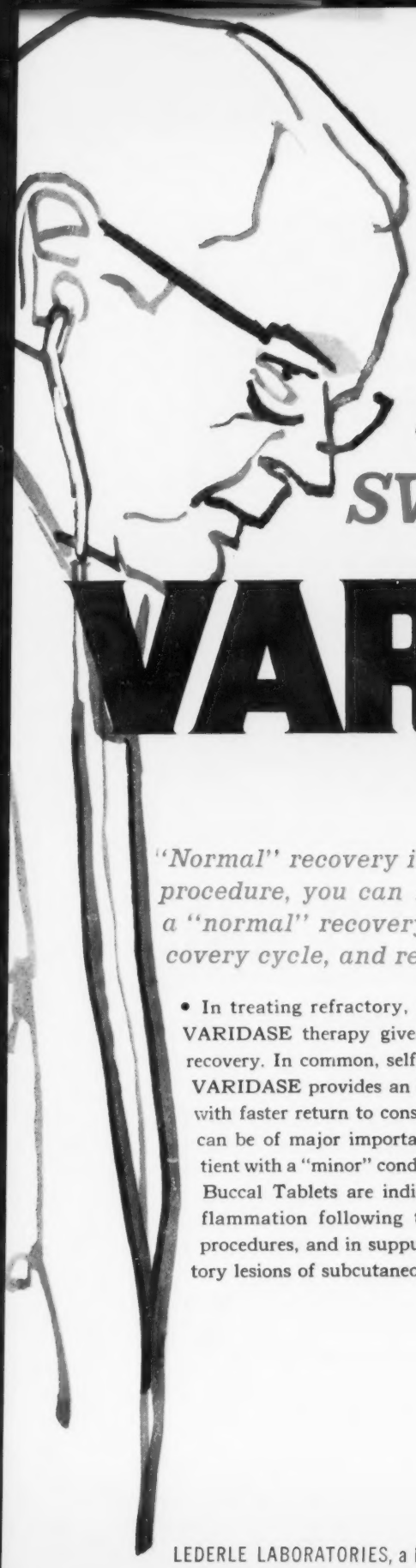

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• In treating refractory, chronic conditions, VARIDASE therapy gives added impetus to recovery. In common, self-limiting conditions, VARIDASE provides an easier convalescence with faster return to constructive living. This can be of major importance even to the patient with a "minor" condition. • VARIDASE Buccal Tablets are indicated to control inflammation following trauma or surgical procedures, and in suppurative or inflammatory lesions of subcutaneous and deep tissues.

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• Supplied: *Each tablet contains 10,000 Units Streptokinase, 2,500 Units Streptodornase. Boxes of 24 and 100 Tablets.*

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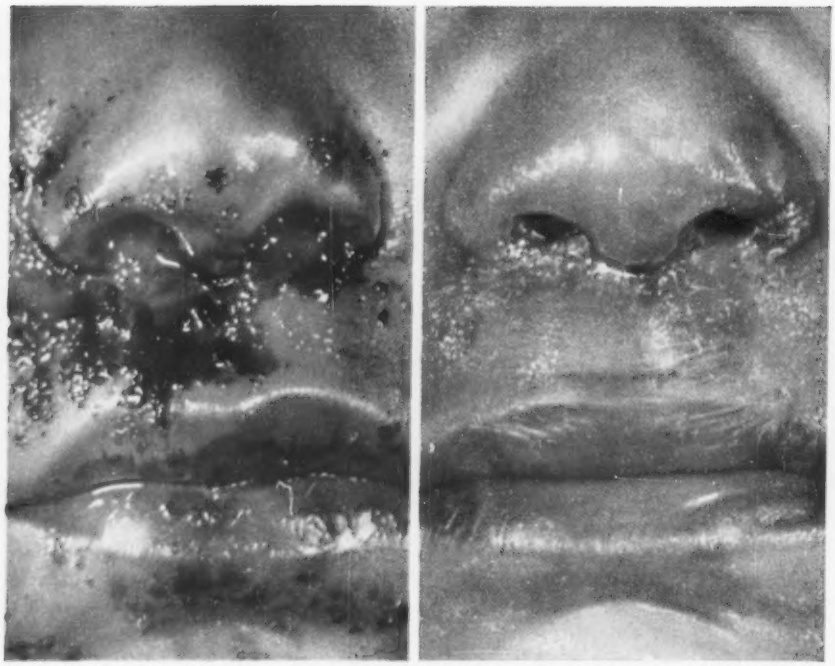

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nitrofurazone 0.2% and hydrocortisone acetate 1%, Eaton

ESPECIALLY USEFUL FOR THE TREATMENT OF INFLAMMATION, ERYTHEMA AND PRURITUS AS WELL AS INFECTION IN SUCH CASES AS PYODERMAS, FURUNCULOSIS AND SECONDARILY INFECTED DERMATOSES

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For the irritable G.I. tract

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MILPATH-400—Yellow, scored tablets of 400 mg. Miltown (meprobamate) and 25 mg. tridihexethyl chloride.
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NEW PARAFON

Combining a superior skeletal muscle relaxant[1-3] with a preferred musculoskeletal analgesic,[4,5] *new* PARAFON FORTE rapidly relieves *both* pain and muscle stiffness in low back disorders. Thus, the effective dual action of PARAFON FORTE increases the patient's range of motion and hastens recovery. PARAFON FORTE is equally effective in other musculoskeletal disorders, such as myositis, whiplash injuries, strains or sprains, and fibrositis. Side effects are rare, almost never require discontinuation of therapy.

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Dosage: Two tablets q.i.d. *Supplied:* Scored, light green tablets, imprinted "McNEIL," bottles of 50.

References: (1) Settel, E.: Clin. Med. *6*:1373, 1959. (2) Peak, W. P., and Smith, R. T.: Penn. Med. J. *63*:833, 1960. (3) Mayle, F. C.; Sullivan, P. D., and Auth, T. L.: Med. Ann. D. C. *28*:499, 1959. (4) Roth, J. L. A.: Med. Clin. N. Amer. *41*:1517, 1957. (5) Batterman, R. C., and Grossman, A. J.: J.A.M.A. *159*:1619 (Dec. 24) 1955.

*U.S. Patent No. 2,895,877

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Systemic Anti-inflammatory Enzyme Preparation

1. Fullgrabe, E. A.: Ann. New York Acad. Sc. *68*:192, 1957. 2. Teitel, L. H.; Siegel, S. J.; Tendler, J.; Reiser, P., and Harris, S. B.: Industrial Med. *29*:150, 1960. 3. Billow, B. W.; Cabodevilla, A. M.; Palm, A.; Robinson, M., and Paley, S. S.: Southwestern Med. *41*:286, 1960. 4. Morani, A. D.; Serlin, O.; King, R. M., and Flynn, J. R.: J. Internat. Coll. Surgeons *34*:709, 1960. 5. Cigarroa, L. G.: J. Internat. Coll. Surgeons *34*:442, 1960.

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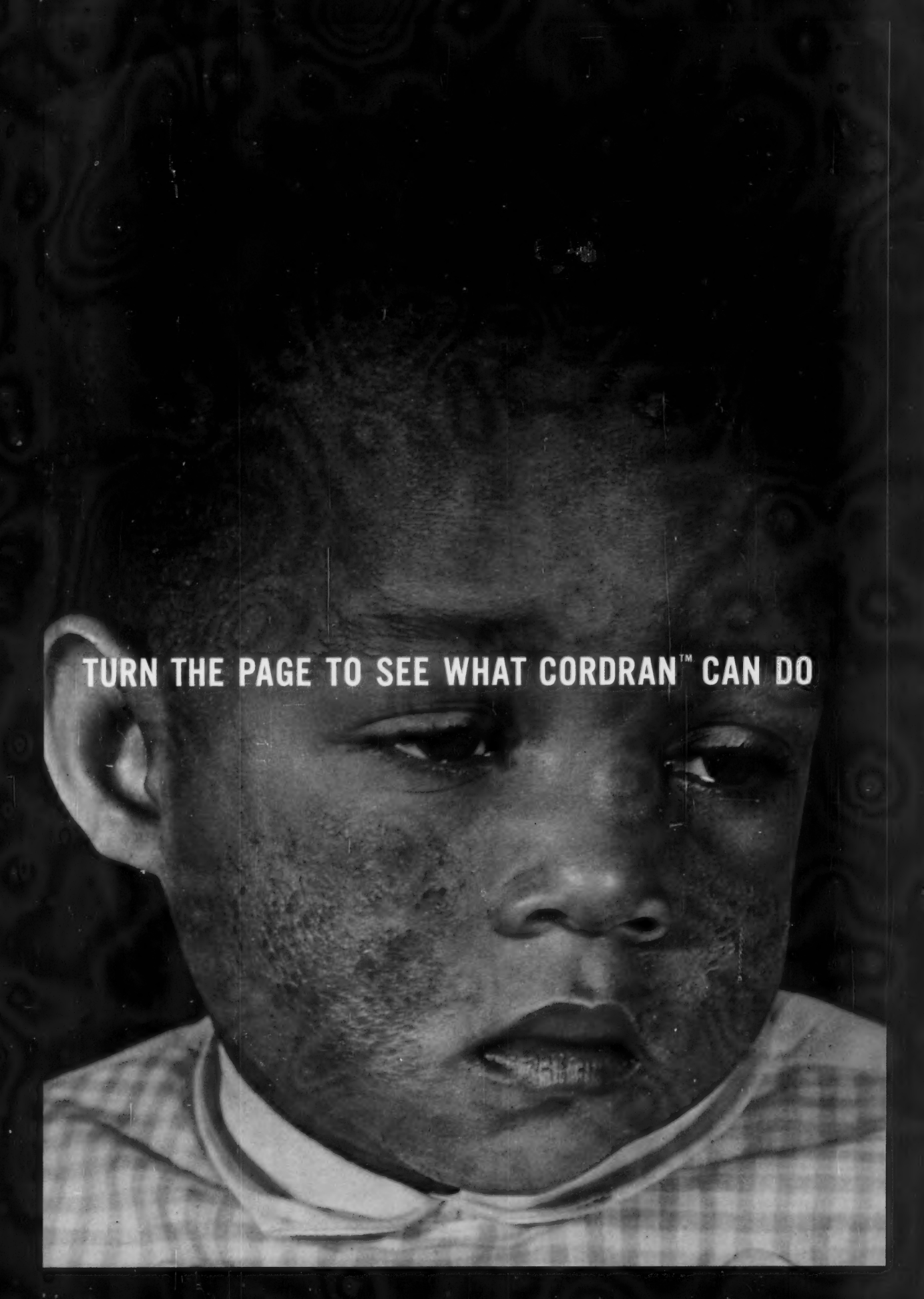
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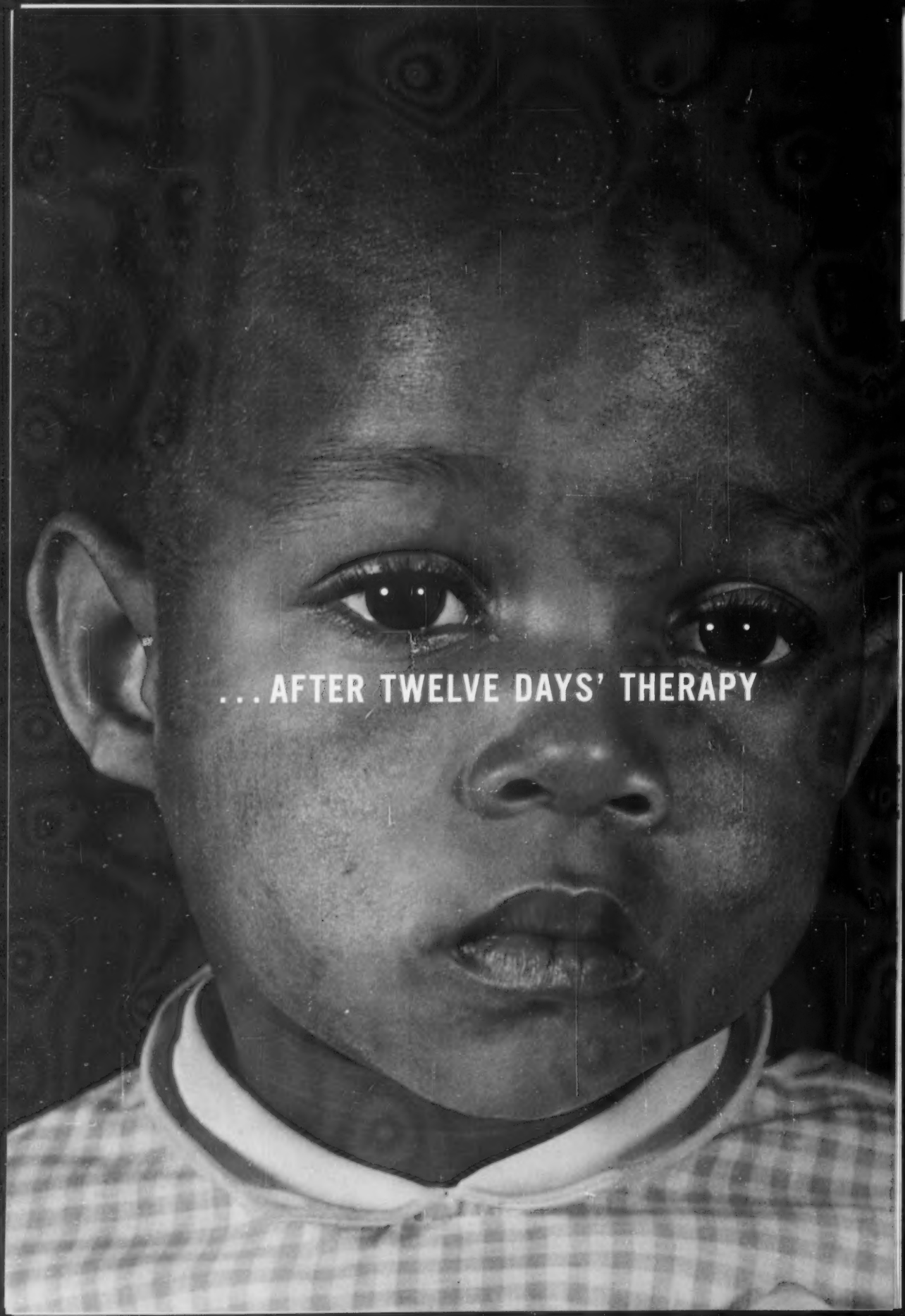
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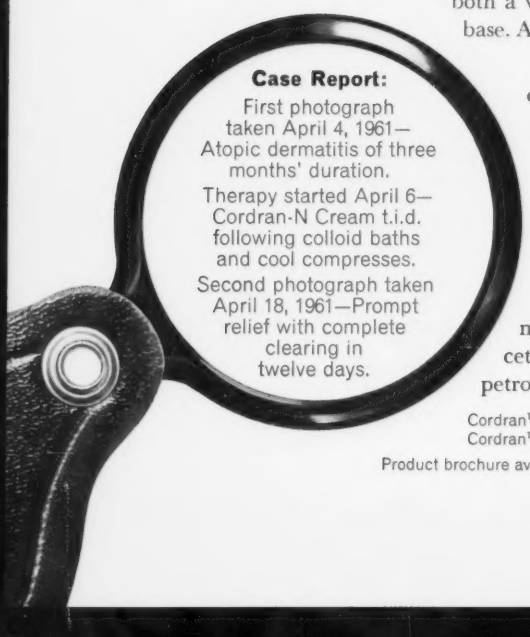
Cordran-N combines Cordran and the wide-spectrum antibiotic, neomycin. It is particularly useful in dermatoses complicated by potential or actual skin infections.

Product Description: Cordran and Cordran-N are available in both a vanishing cream and a hydrophilic ointment base. All forms are supplied in 7.5 and 15-Gm. tubes.

Each Gm. of Cordran cream and ointment contains Cordran, 0.5 mg. Each Gm. of Cordran-N cream and ointment contains Cordran, 0.5 mg., and neomycin sulfate, 5 mg. (equivalent to 3.5 mg. base).

The cream base is composed of stearic acid, cetyl alcohol, liquid petrolatum, polyoxyl 40 stearate, ethyl parahydroxybenzoate, glycerin, and purified water. The ointment base is composed of white beeswax, cetyl alcohol, sorbitan sesquioleate, and white petrolatum.


Case Report:
First photograph taken April 4, 1961—Atopic dermatitis of three months' duration.
Therapy started April 6—Cordran-N Cream t.i.d. following colloid baths and cool compresses.
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Cordran™ (flurandrenolone, Lilly)
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Product brochure available; write Eli Lilly and Company, Indianapolis 6, Indiana.

a case for HALDRONE™

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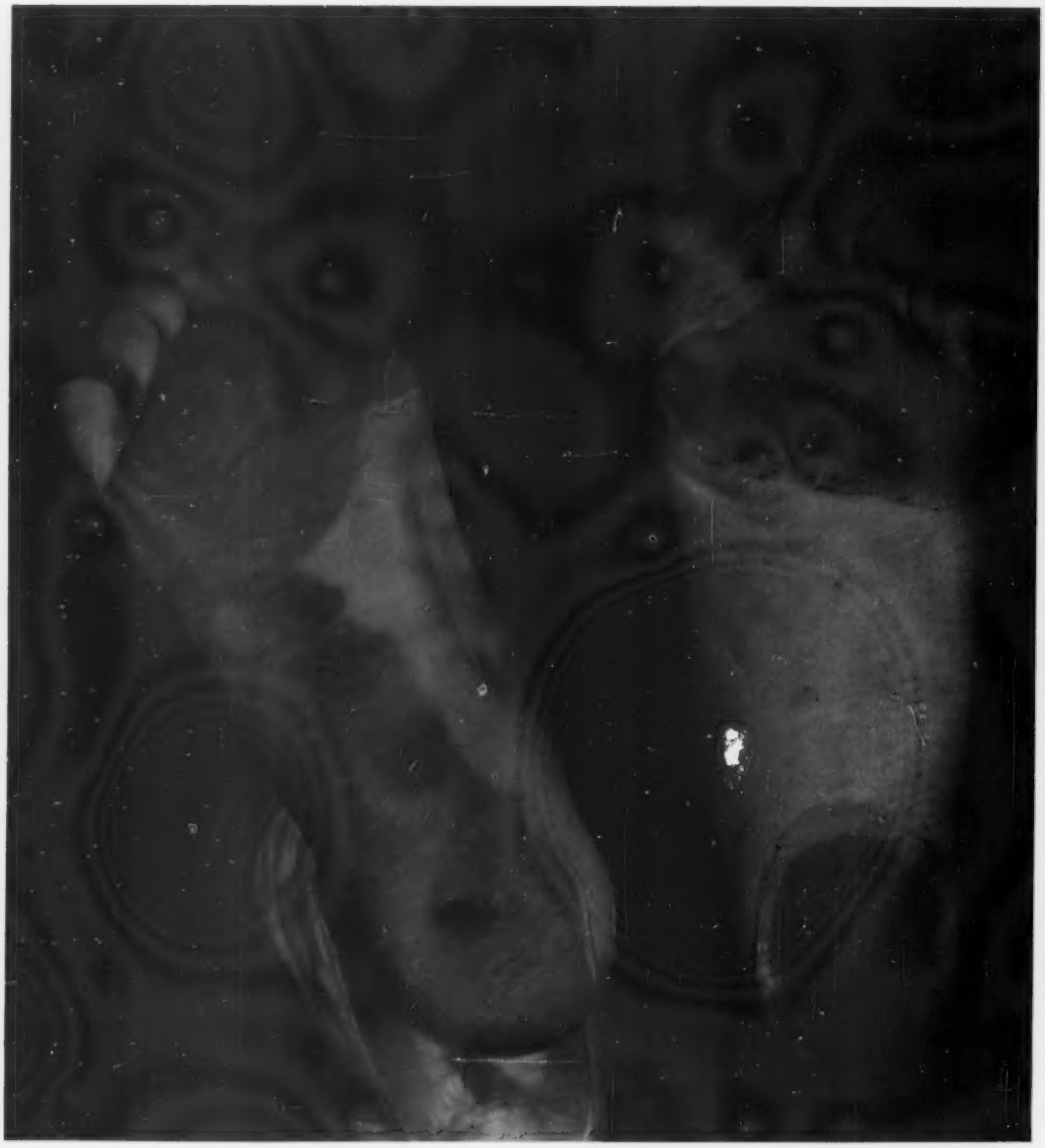

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Supplied in bottles of 30, 100, and 500 tablets:
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Fast, prolonged relief from acid indigestion, with no acid rebound. Bottle of 500 mints, $1.70.

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DARVON® COMPOUND-65

Darvon Compound-65 provides twice as much Darvon® as does regular Darvon Compound without increase in salicylate content or size of the Pulvule®. Usual dosage is 1 Pulvule three or four times daily.

Darvon Compound		Darvon Compound-65
32 mg.	Darvon	65 mg.
162 mg.	Acetophenetidin	162 mg.
227 mg.	A.S.A.®	227 mg.
32.4 mg.	Caffeine	32.4 mg.

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Darvon® Compound (dextro propoxyphene and acetylsalicylic acid compound, Lilly)
Darvon® (dextro propoxyphene hydrochloride, Lilly)
A.S.A.® (acetylsalicylic acid, Lilly)

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120351

The Effect of Inspiratory Airflow On the Uptake of Dust Particles Into the Human Respiratory Tract

• H. DRASCHE, M.D.
Institute of Occupational Medicine
University of Saarbrücken
German Federal Republic

The uptake of dust particles from the atmosphere into the human respiratory tract must be considered as an important problem in occupational medicine, because numerous occupational hazards are caused by the inhalation of finely dispersed noxious substances.

There can be distinguished two main phases, as far as the transport into the respiratory tract of particles suspended in the atmosphere is concerned: (1) the transport by means of the inspiratory airflow from the atmosphere to the entry of the respiratory tract (mouth and nostrils), and (2) the transport of the particle within the upper and lower parts of the respiratory tract into the terminal region of the bronchial tree and into the alveoli by means of the airflow and the molecular movement.

It seems remarkable that although vast experience and knowledge was gained during the past 50 years on the counting and measuring of dust particles and about their fate within the bronchial tree, relatively little attention was paid to factors influencing the transport of dust particles from the atmosphere by means of the inspiratory airflow up to the entrance of the respiratory tract. The following report, based on the results of our investigations, deals with this last mentioned aspect.

These investigations were favored by the extraordinary experimental conditions that were found in a limestone mine. The layer of calcium carbonate with a depth of about 5.0 m (16½ ft.) was located on an average 37.0 m, or about 121 ft., beneath the surface, and the mining procedure included drilling as well as blasting. The mine was not supplied with artificial ventilation. Ventilation by diffusion was minimal and persisted completely at the outside temperature of about 12° C. The drilling equipment provided was a hollow drill, and as wet drilling was not applicable for technical reasons, compressed air was injected through the drill rod to remove the fine dust from the hole. The drilling rate was about 90 cm/min. From the foregoing it is evident that the drilling involved the formation of considerable amounts of dust. Because of the absence of artificial and significant natural (diffusional) ventilation, the dust situation in the galleries was closely comparable to the conditions in the experimental dust chamber.

Methods of investigation included:

1. Studies on the physical work performed by the miners during one shift.
2. Measurements of dust concentrations and dust weights in the underground atmosphere.
3. Determination of the weight of dust, using

samples taken from the filters of the masks worn by the miners during the drilling procedure.

4. Particular lung function studies in miners employed in drilling.

5. Determination of the particle size of the dust, from samples on the filters of the protective masks, by means of the sedimentation method (Andreasen).[1]

Results

Studies on the Physical Work Performed by the Miners During One Shift

Drilling usually was performed by a group of three miners (one foreman and two miners) by means of two drilling machines of the same type. Per shift, 30 holes, approximately 2.7 m. deep had to be drilled; i.e. 10 holes per man in alternating turns. The drill was equipped with a telescoping jack, so that the drilling rod could be advanced continuously by compressed air.

Personal observation of the work for five months showed that the physical demands of the work performed by the three miners, working together in a group, was identical and comparable. For the purposes of this investigation three miners (H. M., A. S., and E. B.) were studied in particular detail. They worked on the same shift, from 6 a.m. to 2 p.m., from April to July, 1960 under similar conditions, as far as dust concentrations, duration of exposure, and strength of work were concerned.

Measurements of Dust Concentrations and Dust Weights in the Underground Atmosphere

Dust measurements were performed during the observation period by means of conimetric and gravimetric methods. The conimetric determination of dust concentration was done with the Konimeter H.S. (Sartorius-Werke, Göttingen/G.F.R.), and the gravimetric determination by means of the dust sampler, Staubmessgerät der Wärmestelle Düsseldorf. For the gravimetric method the dust was collected on glycerin-free membrane filters, type AF 15, manufactured by Membranfiltergesellschaft Göttingen.

The total number of particles/cm^3, determined by means of the conimetric method during five months at several occasions averaged between 2500 and 4000/cm^3; 85 to 90% of the particles were smaller in diameter than 5.0 microns. Particles smaller than 5 microns were especially examined with regard to their content of free silica by means of the phase-contrast method. On the average the values found did not exceed 0.5%.

Gravimetric measurements during the drilling procedure within a period of five months gave values between 150.0 and 300.0 mg/m^3.

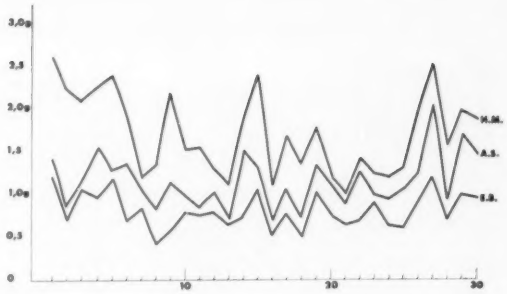

Figure 1

Weight of dust collected on the filters of dust protective masks worn by 3 subjects working under equal conditions (duration of work, strength of work, dust concentration) for 30 shifts, each at 1 round = 30 blasting holes.

Determination of the Weight of Dust Samples Taken from the Filters of Protective Masks

The relatively high dust concentrations and dust weights during the morning shift required protection of the respiratory tract of the miners, which was attained by the half mask type 78 in combination with the filter type 742 St (Dräger). This type of filter guaranteed a high separation rate for all particles larger than 0.1 micron (99.5%) at a minimal breathing resistance (about 6 mm H_2O in unused filters). During the period of observation, all filters were weighed before and after use. For this purpose, the filters were dried in an incubator at a temperature of 105° C at least for two hours, then cooled to ambient temperature in an exsiccator. In all determinations the weight was read exactly 30 seconds after removal of the filters from the exsiccator.

Within five months a total of 500 determinations of dust weight on the filters of 10 miners had been carried out, including about 300 for the three morning shift miners H. M., A. S., and E. B. In a first trial, only those weights were computed that derived from one shift with similar conditions of dust concentration and physical strength requirements for these three miners. Thirty such shifts comprising one round (one round = 30 holes) could be selected.

Figure 1 demonstrates that the weights of dust collected on the filters of the dust protective mask of the three individuals under similar conditions differ with a constant regularity. The weights for the subject H. M. are always higher than for A. S., and the weights of the last mentioned are always higher than those for E. B. Furthermore, the statistical evaluation of the weights provides evidence that the differences are significant ($P < 0.05$).

In Table I the average values of the dust

TABLE I.

Name	Total of determinations	Total weight g	Mean weight p/shift g	Total weight of dust in 30 shifts with 1 round/g	Mean weight of dust per shift with 1 round/g
H.M.	107	209.638	1.959	50.433	1.681
A.S.	99	154.444	1.560	35.251	1.175
E.B.	92	109.926	1.194	25.902	0.863

TABLE II.

Name	Number of shifts at 2 rounds	Total weight of dust collected/g	Mean weight of dust per shift at 2 rounds/g	Difference against mean weight in shifts at 1 round/%
H.M.	17	57.730	3.395	+101%
A.S.	17	38.173	2.245	+91%
E.B.	16	28.700	1.793	+107%

weights represented in Figure 1 are shown. The dust samples were collected under comparable conditions. It is evident that the difference between the average weight of dust found for subject E. B. (0.863 g) and that found for H. M. (1.681 g) almost amounts to 100%.

On several days, this group had to perform two rounds (60 holes) within one shift, and the blasting was done in the following shift. Seventeen such shifts each for H. M. and A. S., and 16 for E. B. could be selected. The results of the determination of dust weights are represented in Table II.

It can be noticed from this table that double work, which means double exposure time in the dust laden atmosphere, is followed by doubling of the weight of dust on the filters of all subjects.

TABLE III.

Name	Mean weight of dust collected in shifts at 1 round (in all shifts)/g	Mean weight of dust collected within 1 year = 280 days in shifts at 1 round (in all shifts)/g	Mean weight of dust collected within 30 years in shifts at 1 round (in all shifts)/kg
H.M.	1.681 (1.959)	470.68 (548.52)	14.120 (16.455)
A.S.	1.175 (1.560)	329.00 (436.80)	9.870 (13.104)
E.B.	0.863 (1.194)	241.64 (334.32)	7.249 (10.029)

Finally, in Table III, the calculated presumptive weights of dust that would collect on the filters of these three subjects within 30 years (one year = 280 working days) are demonstrated. The weight, calculated in this way, leads to some idea about the energy problems involved in occupations performed in a dust-laden atmosphere. H. M. would collect on his filter a total of 16.5 Kg of dust, about 25% of his present body weight (68.2 Kg).

From the results it can be concluded that the observed differences in the weight of dust on the filters must depend on factors of respiratory origin, and especially the inspiratory phase of ventilation, as the working conditions during the sampling were the same for these three subjects. Therefore, particular lung function studies were performed.

Particular Lung Function Studies

Spirographic investigations at rest: At first a determination of the lung function at rest in the three miners was performed (Vital capacity = V.C., residual volume = R.V., maximal expiratory volume = M.E.V., maximal breathing capacity = M.B.C., and total capacity = T.C.). The data of this examination are represented in Table IV.

TABLE IV.
LUNG FUNCTION STUDIES AT REST

Name	H.M.	A.S.	E.B.
Age	40	31	40
Height/cm	168	169	169
Weight/kg	68.2	88.5	74.9
V.C./ml (BTPS)	5390	5280	5240
M.B.C./lit. (BTPS)	160.0	165.0	177.0
M.E.V./% V.C. (BTPS)	77%	79%	79%
R.V./T.C./%	25%	19%	18%
T.C./ml	7060	6520	6590

It can be seen that the subjects H. M. and E. B. are of the same age; body height is almost the same, and body weight differs only slightly. Furthermore, the vital capacity of each of the three subjects is within the same range as is the maximal breathing capacity and the maximal expiratory volume. These values disclose no evidence of any pathologic status within the respiratory apparatus at rest and must be considered as normal.

Spirographic investigation under exercise: Since the dust on the filters had been collected at an elevated level of respiration during the drilling procedure, it seemed appropriate to examine the ventilation of the three subjects during exercise, the level of which approximately corresponded to the underground conditions.

TABLE V.
LUNG FUNCTION STUDIES DURING EXERCISE AT A LOAD OF 100 WATTS/SEC OVER 15 MINUTES ON BICYCLEERGOMETER*

		Subject Connected by Mouth Piece with Spirographic System		Subject Connected by Dust Mask with Spirographic System	
Name		10.′	15.′	10.′	15.′
H.M.	Ventil./min/l.	*34.1*	*32.9*	*36.6*	*36.6*
	Tidal Volume/ml	2270	2350	2090	2030
	Frequency/p. min.	15	14	17	18
A.S.	Ventil./min/l.	*33.4*	*33.6*	*37.1*	*37.6*
	Tidal Volume/ml	1760	1680	1950	1880
	Frequency/p. min	19	20	19	20
E.B.	Ventil./min/l.	*30.2*	*30.0*	*38.1*	*38.0*
	Tidal Volume/ml	2010	2140	2210	2110
	Frequency/p. min	15	14	17	18

*Ventilatory volumes corrected for BTPS.

Figure 2

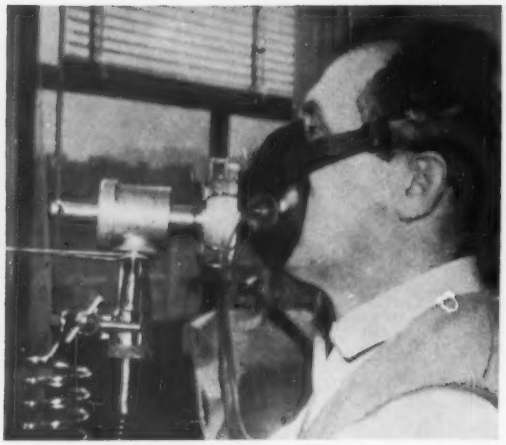

Figure 3

This investigation was performed by means of a spirograph (Lode, Groningen, Netherlands), and a bicycle-ergometer, type Lanooy (Lode). The exercise consisted of cycling for a period of 15 minutes at a load of 100 watts/sec, during which the ventilation data, the oxygen intake and the pulse frequency were registered. This exercise test was performed twice by every subject, each time with a modified connection of the person to the spirographic apparatus. During the first examination, the subject was connected with the spirographic system in the usual manner by means of a mouthpiece, the nose closed with a clip (Figure 2).

During the second examination the subject was connected to the spirographic system by means of a slightly modified dust protective mask of the same type that was used underground (Figure 3).

This double examination was necessary in order to derive basic values that could be compared with the results obtained under standard conditions with other healthy persons.

Table V exhibits the data obtained in this double examination. It must be emphasized that the ventilatory volume/min was almost identical in all three subjects whether they breathed through a mouthpiece or through the modified dust mask. Changing from the first type of connection (mouthpiece) to the second one (dust mask) was followed by an increase of 20 to 30% in the ventilatory volume, which is due to the increased dead space of about 250 ml of the mask.

In summarizing these results, it can be concluded that the volume of inhaled dust laden air is not the only criterion for the different weights of dust. Therefore, a closer analysis of the spirographic tracings during exercise was performed. It could be demonstrated that the timed inspiratory volumes (cm^3/sec) in these subjects differed in an analogous way as did the corresponding weights of dust. As the total inspiratory volume/min in the three subjects had been almost identical, it was obvious that variations of individual inspiratory flow velocities must be of special importance. Particular information about the individual inspiratory air flow could be obtained by pneumotachographic investigations.

Determination of the velocity of inspiratory flow: Adequate measurements were performed by means of the pneumotachographic method.[2,3] The larger model of the pneumotachograph, described by Fleisch, was used. Obviously, this type offered some disadvantages, as far as the determination of absolute values of air velocity were concerned. However, for the purposes of this investigation there were no valid objections to the use of this model because the relative values of inspiratory flow velocity in the subjects were to be determined.

The examination was made at maximal ventilation at rest, the subject being asked to breath as fast and deep as possible at a given frequency of 40/min. Ten tests on different days over a period of six weeks were performed on each subject.

For control, seven workers from the same mine were checked simultaneously. In Figure 4 the results of this pneumotachographic examination of the three miners are demonstrated. The tracings in the upper row represent the individual course of inspiratory flow velocity at the first test, whereas the tracings in the lower row correspond to the last examination after six weeks.

The following conclusions can be drawn from this figure:

1. The maximal velocity of inspiratory flow

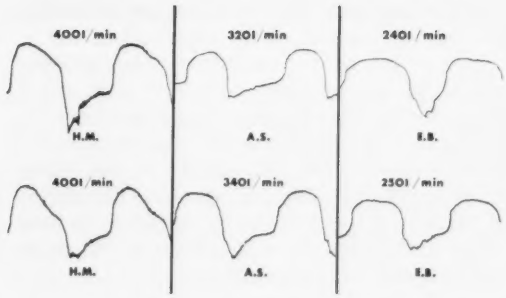

Figure 4

Maximal inspiratory velocity of flow determined in 3 subjects on 2 different days at an interval of 6 weeks. Three types of inspiratory velocity of flow. H. M.: An initial peak flow, immediate decrease of velocity towards the end of the inspiratory phase. A. S.: Cupola-form of velocity tracings. E. B.: Platform-like velocity pattern.

at maximal ventilation at rest differs considerably in the three subjects.

2. The type of inspiratory flow velocity is constant in every subject and reproducible in the same way even after periods of several weeks.

3. The absolute values of individual maximal inspiratory velocities are in direct proportion to the individual average weights of dust collected on the filters. That there exists a close correlation between the weights of dust collected on the filters and the inspiratory velocity is evident from the survey of all results, furnished in Table VI. For comparison, the different absolute values recorded for subject E. B. (with the lowest average dust weight) were equalized with 1.0, and corresponding values recorded for A. S. and H. M. were calculated on this basis.

TABLE VI.
CORRELATIONS BETWEEN THE WEIGHTS OF DUST IN THREE SUBJECTS AND THE FOUR DIFFERENT VALUES OF LUNG FUNCTION, DEPENDING ON THE VELOCITY OF INSPIRATORY FLOW. VALUES IN SUBJECT E.B. ARE EQUALIZED WITH 1.

Name	E.B.		A.S.		H.M.
Timed Inspiratory Volume (mouth-piece)	1	:	1.40	:	2.07
Timed Inspiratory Volume (dust-mask)	1	:	1.17	:	1.44
Maxim. Velocity of Inspiratory flow	1	:	1.34	:	1.63
Weights of dust on Filters (means)	1	:	1.36	:	1.94

It can be concluded from this survey that the inspiratory velocity of flow determines the varying amount of dust moved from the atmosphere to the entrance of the respiratory tract of subjects with identical lung volumes and ventilatory capacities.

Taking into consideration the theoretical basis of the correlations between the dust weights and the different flow velocities during inspiration, it can be assumed that higher velocities move or accelerate particles with a greater mass than do lower velocities, and this would explain the differences in weight of the collected dust. It could be expected, then, that the samples of dust collected by the miner H. M. would contain more particles with larger diameters than those from A. S., and the latter more than those from E. B. In support of this hypothetical consideration, determinations of the particle size distribution within the dust colected on the filters were performed.

Determination of the Particle Size Distribution

For this investigation only such filters, charged under comparable working conditions during one shift by the three subjects with sufficient amounts of dust (at least 1.2 g) could be used. The dust was obtained by careful preparation. The analyses were performed independently in two different institutions, using slightly modified methods as far as the fluid for sedimentation was concerned.

In Table VII the mean values from eight triple analyses are computed. It can be noticed that more particles with larger diameter (greater mass in percentage of weight of the sample) were collected by the subject H. M. who had the highest inspiratory velocity than by A. S. or by E. B. The difference is significant especially in the upper range of the method, concerning the particle sizes from 10-30 microns. As we were dealing with polydisperse dust of the same basic structure and of the same specific weight, it is evident that larger diameters can be equaled to higher weights. It means that higher weights of dust on filters in individuals having higher inspiratory velocities are predominantly due to an

TABLE VII.
RESULTS OF THE SEDIMENTATION ANALYSIS[1]
Means Out of 8 Triple Analyses with Different Sedimentation Fluids.

1. Means out of 5 Analyses with Absol. Alcohol (weight-%)

Particle Diameter/ microns	H.M.	A.S.	E.B.
>40	18.7	17.0	8.5
>30	23.0	18.0	13.5
>20	41.2	31.4	27.4
>10	81.6	72.4	61.8
>5	93.7	92.0	85.8
>3	96.8	94.9	91.9
>2	97.6	95.6	93.4

2. Means out of 3 Analyses with Butyleneglycol (weight-%)

Particle Diameter/ microns	H.M.	A.S.	E.B.
>40	14.5	12.0	5.0
>30	16.0	14.6	7.3
>20	22.3	21.0	12.1
>10	47.0	46.3	37.6
>5	77.3	76.5	74.6
>3	89.3	88.5	88.0
>2	93.3	93.3	93.1

increased acceleration of heavier particles. Variations in inspiratory velocity apparently induce a separation of particles according to their mass. However, as particles larger in diameter than 5.0 microns are not of importance in the pathogenesis of pneumoconiosis, it seemed to be of value to examine the correlations between the inspiratory velocity and the amount of dust in the size range smaller than 5.0 microns collected on the filters. The average percentage of weight of all particles smaller in diameter than 5.0 microns was calculated for each subject from the data of the sedimentation analysis, and by comparing it with the mean weight of three dust samples, the absolute weight of particles in the size range under 5.0 microns was obtained.

TABLE VIII.
PERCENTAGE OF WEIGHT OF THE PARTICLES <5 MICRONS FROM THE TOTAL WEIGHT OF THE SAMPLES OF DUST BY THE ANDREASEN METHOD. FLUID OF SEDIMENTATION: BUTYLENEGLYCOL.

H.M.		A.S.		E.B.	
No. of Sample	Weight of Dust/g	No. of Sample	Weight of Dust/g	No. of Sample	Weight of Dust/g
151	1.994	152	1.245	153	1.185
167	1.948	165	1.774	166	1.189
168	1.854	170	1.502	169	1.259
Total	5.796		4.521		3.633
Mean	1.932		1.507		1.211
% of Weight of Particles <5 microns	22.7		23.5		25.4
Weight of the Particles in the Size Range <5 microns/g	0.438		0.354		0.307
	(140%)		(114%)		(100%)

This evaluation was performed in using the records from the sedimentation analysis by means of butylenglycole as sedimentation fluid (Table VIII). It can be seen that individuals with higher inspiratory velocity collect on their filters not only particles in a greater size range than individuals with lower inspiratory velocity, but they collect also more particles that are likely to reach the alveolar regions.

Comment

The principal conditions that made possible the investigations laid down in this paper were the following:

1. The application in industry of a newly developed dust filter that has a high separation rate at low breathing resistance and a low manufacturing cost which means that the filters need to be used only during one shift.

2. The ideal experimental conditions at the work place, in a limestone mine characterized by considerable dust concentrations originating from one substance only and by the absence of artificial ventilation.

3. The uniformity of work performed by the miners over a period of several months.

It is seldom that conditions for experimental investigations are found in industry. It seems to be an advantage to draw conclusions from the results of a field survey performed under actual circumstances. From the results of this study, it can be concluded that by individual modulation of the velocity of inspiratory air at equal lung volumes and ventilatory capacities a separating effect on dust particles according to mass is produced before they enter the respiratory tract. Similar conclusions about the significance of inspiratory air flow velocity have been drawn recently by Silverman and Billings, as far as the fate of particles within the respiratory tract is concerned.[4] Furthermore, it could be demonstrated by serial examinations during several months, that this separating effect of different inspiratory velocities is followed by significant differences in the amount of dust collected on the filters of the protective masks, attaining in the case of the subject H. M. and E. B., a difference of 100%.

Considering the individual variability in inspiratory velocity, the question has to be raised as to whether this phenomenon is due to a physiologic or a pathologic condition. The presence of a pathologic state was excluded by detailed anamnestic, clinical, and radiological examination as well as by extensive lung function studies at rest and during exercise. The lung function studies at rest did not reveal any signs of limited lung volumes or ventilation capacities in the three subjects. The records of the exercise tests are in good correlation between the values registered by other authors in similar examinations, as far as the ventilatory volumes/min are concerned. Although studies of the lung mechanics (compliance-, elastance- and resistance-tests) have not been performed in our subjects, essential and measurable disturbances in this respect can be excluded, according to the experiments made by Ehrner.[5] There is no doubt that the individuals have to be considered normal and healthy.

It follows, then, that the individual variations in inspiratory velocity are due to physiological or, better, constitutional factors, because of the subsequent considerations:

1. Determinations of inspiratory velocities by means of the pneumotachographic method have been performed during maximal ventilation at rest. The subjects were asked to breath as deeply and as fast as possible at a given frequency, which means that the neuromuscular system of ventilation was stimulated at the beginning of each inspiration to breath the vital capacity.

2. It is known that the vital capacity, ade-

quate collaboration supposed, is reproducible and is not exposed to significant changes over long periods in healthy subjects. The reproducibility and constancy of the pattern of inspiratory velocity at maximal ventilation could be demonstrated by means of the pneumotachographic examination. Breathing of the vital capacity guarantees a high degree of spontaneity.

3. Although the medium to heavy work performed by the miners did not require a continued maximal breathing capacity, it could be demonstrated in a preliminary study that the characteristic pattern of inspiratory velocity was also maintained under diminished intensity of ventilation, whereas at rest no typical pattern was observed.

4. It can be assumed, therefore, that the modeling of the inspiratory velocity pattern in maximal and elevated spontaneous ventilation depends essentially on different constitutional factors, such as the predominance of costal or diaphragmatical breathing, the shape of the thoracic cage, the autonomous nervous regulation of breathing, and the tension of respiratory musculature.

Conclusions

In experimental dust inhalation studies in man it should be recognized that variations in individual inspiratory velocity patterns are of the same importance as the volume of the dust laden air that is inhaled during exercise, especially in those cases where the degree of retention within the respiratory tract from a given outside dust concentration has to be determined.

2. Different complaints about breathing troubles in subjects working under equal conditions in a dusty atmosphere can be explained by the separating effect of inspiratory flow at different velocities. From the average weights of dust collected on the filters of the miners H. M. and E. B. in our study, it is evident that H. M. was depositing on his filter within the same time period twice as much dust as did E. B., which means that the breathing resistance was almost doubled.

3. Finally, these findings are of interest in the field of pneumoconiosis research. Among the numerous theories on the pathogenic principles of pneumoconiosis, constitutional factors have been discussed, but, unfortunately, up to now no definite proof could be established about the nature and the basis of this theory. But it is well known that in addition to the quality or the chemical structure of inhaled dust, the quantity of it plays an important role in the pathogenesis of pneumoconiosis.

In this contribution, it could be demonstrated that the inspiratory velocity pattern, predominantly dependent on constitutional factors, causes significant differences in the uptake of dust particles smaller than 5.0 microns in healthy subjects with equal lung volumes and equal ventilation capacities.

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Interviewing Guide on Epilepsy

The Bureau of Employment Security of the U. S. Department of Labor has published a revised edition of its interviewing guide on epilepsy that is now available to the public. This guide, one of the series entitled "Interviewing Guides for Specific Disabilities," was prepared to serve as an aid to persons engaged in vocational counseling and job placement of persons having epilepsy. The 1961 edition places emphasis on the employability of epileptics whose seizures are substantially controlled and on the realistic consideration of physical activities and working conditions in the selection of work suitable for them.

The booklet is for sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C., at five cents per copy.

THE GIFT OF OTHER WISE MEN

Soon after the birth of Christ in Bethlehem wise men, the Magi, came before Him bringing rich gifts. These were the first Christmas gifts. Since that time Christmas gifts have appeared in endless profusion. All gifts are large. There can be no such thing as a small gift. Before the days of the Magi and later and even to this day there have been other wise men and women. All have brought gifts to mankind and at all seasons. However intangible it may be, one of the largest of all gifts is the gift of imparted knowledge. Such a gift may be found in the writings to follow. In its warm and hearty purpose, Christmas time is meant to bring only joy to the world's millions. Instead and unhappily it may bring only pain and misery to the hundreds. Always there lurks the dangers of Christmas fires and burns, the hazards of faulty electrical equipment, the leaden toys and the pewter soldiers. To that lot may be added the small perils of some traditional Christmas greens. All Christmas greens are cherished symbols of life everlasting. Never are they to be scorned and avoided. But some few betray man's trust in their symbolic message. A few Christmas greens bear threats to the happiness of the Christmas season. That imparted knowledge is the gift to be found in the presentation now appearing.

TOXICITY OF TRADITIONAL CHRISTMAS GREENS

A report from the Clinical Toxicology of Commercial Products Project Departments of Pharmacology, University of Rochester School of Medicine and Dentistry, and Dartmouth Medical School.

APPLE-LIKE FRUITS OR BERRIES

(Woody Plants) **Toxicity: Low**

Cut branches are used in vases or as part of wreaths or similar ensembles.

a. Crataegus (hawthorn)
b. Pyracanthus (firethorn)
c. Cotoneaster (cotoneaster)

Closely related and very similar in aspect.

One fatal case has been reported by Greshoff (1908-09) from Holland. Pammel suggests that some American species may be poisonous. Ivanov (1949) says that slight transitory poisoning resulted in children who had eaten too many fruits. In each case the words "many" and "too many" are used. No other American authority, nor *U. S. Dispensatory* nor *Chemical* nor *Biological Abstracts* mention toxicity. There are thousands of hawthorns and only three, all European forms, are specifically mentioned as toxic; C. oxyacantha; C. sanguinea and C. ambigua. The toxic material is supposed to be a cyanogenetic glucoside.

d. Toyon berries

Similar to and related to the above. Berries are nontoxic. Wilted foliage contains a cyanogenetic glucoside, which when ingested in quantity by cattle has caused death.

BALSAM, JUNIPER, CEDAR, PINE, FIR

Toxicity: Low

Oils of these are somewhat poisonous but they are distilled or expressed from large bulks of stock for little yield. It takes 5 to 10 ml. to be toxic. Juniper berries are nontoxic.

BAYBERRY

Toxicity: Low

Usually seen as a gray-to-blue berry, wax-coated and aromatic. Hard seed in center on a leafless twig. Used in dry arrangements. Two families involved. Neither is toxic.

BITTERSWEET, American (Celastrus scandens)

Toxicity: Low

(Do not confuse with European Bittersweet—Solanum dulcamara—for which see below.)

Usually seen as a leafless, woody, heavily-berried plant in dried arrangements. Taste is bitter and sweet.

Horses are said to have been poisoned by eating the plant (Muenscher[1]). Exhaustive search

in *Chemical* and *Biological Abstracts* reveals no evidence of high toxicity. Mosso extracted a small amount of crystalline material which, when injected, stopped a frog heart in systole, had no effect on mammalian blood pressure, but raised temperature and stimulated the brain without subsequent depression (See *U. S. Dispensatory*[6]). There is good evidence that Indians used the berry as food when food was short (*Biological Abstracts*).

BITTERSWEET, European (Solanum dulcamara) **Toxicity: 4; of berries, less**

This plant is unlikely to be used cut or as part of a floral ensemble because it does not keep. It is highly unlikely to be usable at Christmas time as it is not available in most localities at that time of the year.

Berries in clusters, ovoid, bright red, with transparent skin and many seeds, juicy. Leaves, thin in cross section, halberd-shaped (one lance-shaped part with two protruding wings at base). Plant herbaceous rather than woody. It would not be found in a wreath ensemble.

Toxic Principle

Solanine — alkaloydal glucoside, and others.

Symptomatology

1. Nervous forms: Symptoms of narcosis and paralysis. (Muenscher[1]).
2. Gastric forms: Salivation, vomiting, bloating and diarrhea. (Muenscher[1]).

Treatment

Symptomatic. Gastric lavage. Paraldehyde (2-10 ml.) intramuscularly. Oxygen and if necessary artificial respiration for respiratory depression. (Locket[2]). Fluid (5% glucose-saline) administered intravenously if patient cannot swallow within 24 hours. Estimated lethal dose of solanine at least 400 mgm. (Locket[2]), the equivalent of 30 or so berries in all likelihood. (Estimated from a case of poisoning [England] of a 9 year old child.)

BOXWOOD (Buxus) **Toxicity: Low**

Plant is broad-leaved, woody evergreen used in home plantings and Christmas decorations.

Toxic Principle

Buxine. It is highly unlikely that enough of the boxwood leaves and stems could be ingested to be damaging; its taste is bitter and unattractive. Muenscher[1] lists it as poisonous to livestock. Locket,[2] Dayton and Hayes[3] and Kingsbury,[8] do not. *Biological Abstracts* notes hypotensive effect of alcoholic solution and states that 0.4 grams per kg. body weight of Buxine intermuscularly is the estimated lethal toxicity in dog.

Symptomatology

Emetic and purgative action. Central nervous symptoms and convulsions. (Muenscher[1]).

EUCALYPTUS (Pods and Foliage) **Toxicity: Low**

(for the same reason as balsam)

It takes 10 ml. of the oil to be toxic. (Locket[2]). Used as a vase green or in wreaths or other ensembles.

TOXICITY OF TRADITIONAL CHRISTMAS GREENS

	Toxicity
1. Apple-Like Fruits or Berries	Low
2. Balsam, Juniper, Cedar, Pine, Fir	Low
3. Bayberry	Low
4. Bittersweet, American	Low
5. Bittersweet, European	4
6. Boxwood	Low
7. Eucalyptus (Pods and Foliage)	Low
8. Holly	Low
9. Ivy	Low
10. Jerusalem Cherry	4
11. Jequirity Bean	6*
12. Love Apples	Low
13. Mistletoe, American	2-3
14. Mitchella	Low
15. Yew	3

*6 Only if shell is broken.

Toxicity Rating		Probable Lethal Dose for 70 kg. Man
6	Super toxic	A taste (less than 7 drops)
5	Extremely toxic	Between 7 drops and 1 teaspoonful
4	Very toxic	Between 1 teaspoonful and 1 ounce
3	Moderately toxic	Between 1 ounce and 1 pint (or 1 lb.)
2	Slightly toxic	Between 1 pint and 1 quart
1	Practically nontoxic	More than 1 quart

From GLEASON, M. N., GOSSELIN, R. E., HODGE, H. C.: *Clinical Toxicology of Commercial Products.* Williams & Wilkins Co., Baltimore, 1957.

HOLLY **Toxicity: Low**

There are three hollies used in Christmas decorations, Ilex opaca (American Holly), Aquifolium (English Holly), and Ilex verticellata of aquifolium. Two (opaca and aquifolium) are obviously hollies. Verticellata is usually seen as leafless, berried twigs in dry bouquets.

Muenscher[1] says the berries are reported toxic. Locket[2] quotes him. Dayton and Hayes,[3] Bailey,[4] N. Taylor,[5] do not list berries as poisonous. *U. S. Dispensatory* merely notes, beyond material cited, that about 10 or 12 berries of aquifolium usually act on bowels. All berries are bitter and acrid.

According to *U. S. Dispensatory*, Ilex aquifolium has been used medicinally for jaundice, gout and as a diuretic. Contains ilicin as does Ilex opaca. Ilex verticellata used medicinally also.

Symptomatology

The berries of the holly may produce catharsis with some vomiting. Occasionally, in addition, mild narcosis. (Locket[2]).

Treatment

Symptomatic. Gastric lavage. If persistent diarrhea and vomiting occur, give intravenous saline to counteract loss of salts and fluid. Meperidine (50-100 mgm.) atropine gr. 1/100 to 1/60 (0.5 to 1 mgm.) will relieve abdominal pain and colic. (Locket[2]).

IVY (Hedera Helix) **Toxicity: Low**

1. Plant is the common woody evergreen ivy used as a house plant and as wall and ground cover. It never berries unless plants are mature, house plants are seldom mature. Does not berry heavily in the north. Leaf is three-to-five lobed. Resembles a small maple leaf. It is unlikely if not quite impossible to ingest foliage enough to produce toxic symptoms. Berries seldom seen on cut ivy branches.

2. Taste acid, resinous, leaf bitter.

3. Alcoholic extract of fruits intramuscularly 0.3 to 0.5 grams per kg. body weight in dog, estimated lethal dose.

Symptomatology

Similar to atropine without dryness of mouth (Locket[2]).

Treatment

Symptomatic. Gastric lavage. Paraldehyde (2-10 cc.) intramuscularly for excitement. For respiratory depression, oxygen and artificial respiration as necessary. Fluid (5% glucose in water, saline, or both) administered intravenously if after 24 hours patient cannot swallow. (Locket[2]).

JERUSALEM CHERRY (Solanum Pseudocapsicum) **Toxicity: 4**

Herbaceous plant with thin halberd-shaped leaves, and half inch diameter red or yellow tomato-like juicy berries.

Toxic Principle

Solanine, a steroid alkaloidal glycoside with sapotoxic effects (protoplasmic poison like the saponins). No specific antidote is known.

Symptomatology

Two prevalent forms have been observed:

1. CNS forms: narcosis and paralysis
2. Gastrointestinal form: salivation, vomiting, bloating, diarrhea

Treatment

Gastric lavage. Oxygen and artificial respiration if progressive central nervous depression develops. Paraldehyde i.m. (2-10 cc. in adults; 0.08-0.1 cc. per pound, but not more than 10 cc. in children) in cases with agitated or delirious behavior. Otherwise symptomatic treatment.

JEQUIRITY BEAN (Abrus Precatoria) **Toxicity: 6, if shell is broken***

A hard-coated scarlet bean with a black eye (hilum); divides into two halves like all beans. It is either used in the dried pods in dry arrangements or singly, glued to twigs or foliage.

Toxic Principle

The beans contain Abrin (not to be confused with abrine [N-methyl tryptophan]) a toxalbumin closely related to ricin which occurs in castor beans. There is no specific antidote. Antiricin, an antiserum for ricin, may be of value if available but cannot replace supportive therapy.

Symptomatology

Vomiting, severe diarrhea and abdominal pain. Dehydration may develop rapidly leading to death from shock and circulatory collapse. If the acute stage is survived, jaundice (indicating some form of toxic liver damage) and anuria may occur.

Treatment

Gastric lavage is of value only immediately

*If the bean is swallowed with the shell intact, the toxic principles apparently are not liberated.

after ingestion; usually is without value after onset of symptoms.

The treatment is to be directed towards the immediate correction of the severe dehydration. The usual intravenous electrolyte solutions (5% glucose in water or saline or both) are to be used here, blood and plasma expanders if shock develops, followed by adequate oral hydration when the blood pressure remains at a satisfactory level and fluids are retained. Demeral (50-100 mg. in adults; 0.3 to 0.5 mg. per pound, but not more than 100 mg. in children) may be used for the alleviation of abdominal pain. The treatment of the possibly ensuing jaundice and anuria is symptomatic. Because of their usefulness in other instances of toxic liver damage, corticosteroids and ACTH might be considered here.

LOVE APPLES (Rose Hips) **Toxicity: Low**

The decorative fruits of several briar-type roses. Used in dry arrangements or as part of a wreath or similar ensemble. Large (usually) red to orange fruits borne upon thorny, leafless stems. Many-seeded. Used in jellies. Old flower parts visible on berry opposite stem end.

MISTLETOE, American (Phoradendron flavescens) **Toxicity: 2-3**

(Do not confuse with Viscum album, European Mistletoe, which is its physiological antithesis. The latter does not exist here.)

American mistletoe extract (U. S. Dispensatory), when injected, causes a sharp rise in blood pressure (Crawford, *J. A. M. A.* 1911-57). Clinical use is suggested by Hanzlik and French because of its stimulating effect on involuntary muscle.

Muenscher[1] cites Pammel[7] as attributing the deaths of several children to eating berries. Dye, cited by U. S. Dispensatory[6] writes in the *Memphis Medical Recorder*, IV-334, regarding cases of poisoning. Dayton and Hayes[3] list it as poisonous. Bailey[4] and Taylor[5] do not. Neither symptoms nor treatment described.

MITCHELLA **Toxicity: Low**

A small, usually supine plant. Evergreen branches 3 inches to 15 inches long. Branches or side branches terminate in two, sometimes one berry. Red and pink-to-white. Edible. Used in terraria. Once used in medicine. Abandoned as worthless (U. S. Dispensatory).

YEW (Taxus baccata, and other yews) Toxicity: 3

A flat-leaved conifer with 3/8 inch diameter pink berries with one hard seed. Bark, foliage and seeds (when broken) are toxic. The sweet flesh of the berries is not toxic.

Toxic Principle

Taxine and taxicatin, alkaloids of unknown structure. Estimated lethal dose, 3 to 5 mg./kg. Twigs and foliage about 0.7 g./kg. No specific antidote available.

Symptomatology

Vomiting, diarrhea and abdominal pain. Muscular weakness, delirium, convulsions going to coma. Peripheral and circulatory collapse, respiratory failure.

Treatment

Symptomatic. Gastric lavage. Intravenous electrolyte solutions (5% glucose in water, saline or both) for the control of dehydration and shock. Demeral (50-100 mg. in adults; 0.3 to 0.5 mg. per pound but not more than 100 mg. in children) for abdominal pain. Paraldehyde i.m. (2 to 10 cc. in adults; 0.08 to 0.1 cc. per pound but not more than 10 cc. in children) in cases of agitated or delirious behavior. Oxygen and/or artificial respiration may become necessary in respiratory failure.

Acknowledgement is made to Dr. Harold H. Borgsted for the toxicity ratings and for his comments on symptomatology and treatment.

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—RICHARD C. HART

Man's Occupations on Postage Stamps

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It is only in recent years that many facets of human life have been pictured on postage stamps. Decades ago, a government would have thought it preposterous to put a man with a pick and shovel on a stamp. Such an honor was thought to be the prerogative of emperors, empresses, royal children, monumental buildings, battle scenes, coats of arms. Had stamps been in use at the time of Caligula, he would have put his horse rather than a slave on one. The sower of France, designed by Roty in 1903 and redesigned by Piel in 1960, is probably the first adhesive to pay honor to the farmer. Perhaps 90% of the honor was intended to go to the sowing of ideas.

When revolutionary governments came to power, laborers at work appeared on the stamps. However, with humble laborers employed as emblems, the heads of party leaders still follow the tradition of kings and emperors.

Symbols of labor are shown as muscular men holding a pick, a pitch fork, a hoe, a scythe, or standing behind a huge dented wheel or a lone plough. Of this type is a stamp of Southern Rhodesia showing a farmhand with a hoe on his shoulder and the framed picture of his queen in the corner; a sculptor at work on a stamp of San Marino; a dented wheel from Luxembourg, Italy, Argentina, Germany, Bulgaria; a dented wheel and factory funnels from Indonesia; a composition of rice, tractor, farmer and ox from Southern Vietnam; a pick-man from Bolivia, etc.

Stamps showing agricultural scenes are very popular. Many countries followed the pattern of the 1903 sower of France (the United States, Lithuania, Italy, Bolivia). The popularity of

The Sower of France and Her Followers

Agricultural Scenes

scything and harvesting wheat shows that daily bread is uppermost in the minds of Europeans and Asiatics (Bulgaria, Germany, Roumania, Tunisia, Syria, Hungary, Denmark) in contrast, for instance, with our United States. Modernization of the farm is shown in the numerous stamps with mechanical tractors (Czechoslovakia, China).

Italy, in its colorful labor series of 1950 shows a farmer ploughing by hand, girls harvesting grapes, olives, oranges, hemp. Cuba and Togo honor their coffee; France and Luxembourg, grapes; Surinam, bananas; Ceylon, tea; Aden, dates; Turkey and Caicos Islands, salt; Italy and Nigeria, timber (lumberjacks walking the logs with poles); Bulgaria, Colombia, Cuba, Italy, tobacco; Laos and Thailand, rice; Argentina, Barbados, sugar; Hungary, vegetables; Canada and Brazil, oil.

Artistic rural subjects are shepherds tending sheep, herdsmen tending cows, pigs, horses (Italy, Hungary, Papua and New Guinea, Australia, Argentina). Interesting is a New Zealander shearing a ram. In the argicultural group, also, are the stamps showing a cheese factory (Switzerland), a butter factory (New Zealand), a girl making butter by hand (Bulgaria), woodsmen splitting trees (Yugoslavia, Italy).

Heavy metal industry, mining, and construction are well represented, especially on stamps of Russia and satellite countries. A stamp of Canada shows a coal miner; Venezuela, an oil-drill operator. Miners are represented from China and Nigeria; miners of gold from Colombia, of tin from Nigeria, of silver from the United States. Sifting sand for gold is shown on stamps from Canada, United States and Nigeria. A tin

The Daily Bread is Uppermost in European Minds

Among the Peaceful Rural Scenes, the Shearing of a Ram

Next to the Bread, Industrial Competition is the Favored Theme

miner stamp from Nigeria bears the queen's picture in a corner.

The mason is seen on stamps from Australia and Hungary, and the mixing of cement is shown on a Polish stamp. Workers in front of flaming steel ovens are shown on stamps from France, Bulgaria, Czechoslovakia, the Saar, and Yugoslavia; a man at the anvil is seen on Italian, Philippine and Russian stamps; and there are other stamps showing a welder at the lathe (Hungary, China, Czechoslovakia, Italy). An impressive one of this kind is the United States stamp honoring the handicapped, showing a man operating a drill-press while confined to a wheel chair.

A few stamps show the spinner in front of his bobbins (China, Czechoslovakia, Hungary,

Milk and Dairies

The Gold and Tin Diggers

General Construction

Heavy Industry

The Textile

Poland); a few others show the weaver at the loom (Roumania, Somalia, Italy, Nigeria, Bulgaria); India shows an industrial textile establishment. A woman at a pillow, making laces by hand (Italy), belongs to this group, a curiosity, in the mechanized world of the present age.

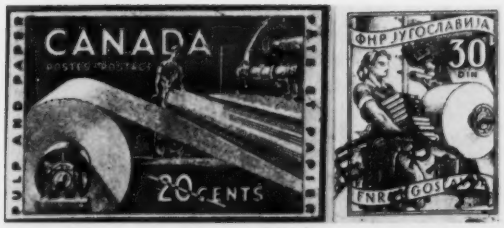
Among workers at miscellaneous trades are makers of baskets (Dominican Republic), of

Musicians and Actors

The Ceramist, Decorator, Pottery Worker

The Railroad—
Look at the
Shins for the
Occupational
Marks

Manual and
Mental Labor —
The Physician
Has Many
Poses



Paper and Books

The Lineman

The Fishing Industry

mats (West Samoa), of artificial flowers (Roumania), an engraver of mother of pearl (French Polynesia), a radio assembler (Hungary). The paper industry (Canada, Yugoslavia) and the installation of railroad sleepers (Sweden) also appear. A few more stamps show the lineman on a utility pole (Austria, Eritrea, Hungary).

A few stamps honor the fisherman (Tunisia, French Polynesia, Hungary, Aden, Italy). Artistic are the stamps honoring the ceramists, and decorators of pottery (France, China, North Vietnam, Nigeria, Hungary).

The mailman is well represented (Guatemala, Belgium, Switzerland, Saar, United States). New Zealand shows a Maori mail carrier of 1855. Also the truck driver (United States), the bus driver (Hungary), the railroad conductor and the maintenance worker on the tracks, the helmsman (Monaco, Austria, Congo, Italy) and the helmswoman (Germany).

Luke Fildes depicts vividly the physician of decades ago absorbed in mental work, doing his best, even if not very much. Modern physicians and helpers in their manual-intellectual work are illustrated in stamps of Liberia, Czechoslovakia, Belgian Congo.

Finally, there are stamps for which one needs the skill of Sherlock Holmes to find out what the worker is doing!

(Above) The Mail—Look on the Shoulder for the Occupational Mark

Symbolic Sherlokians

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Acute Psychiatric Problems in Industry

Industrial physicians have become increasingly aware of the psychiatric problems in industrial medical practice. Several textbooks have been written on the subject in recent years — by Dr. W. Donald Ross, and by McLean and Taylor, among others.[1,2,3] However, one of the most difficult problems, the acute psychiatric emergency, has been handled in a rather sketchy manner. Most authors have simply advised referral to the family physician or to a consulting psychiatrist, and it is true that many problems that develop over some time can be recognized and the proper referral accomplished.

The industrial physician's interest in the preventive aspects of health care must make him aware of the premonitory signs of mental illness that require urgent investigation. Both the medical department and the supervisory personnel of an industrial organization must be prepared to recognize the warning signs of mental illness, and must also be prepared to act quickly when warning signs present themselves.

There are many symptoms and signs of impending breakdowns, but there are some that are more readily observed by those who come in contact with the patient daily, including:

1. Sudden changes in personality — hostility, irritability, apathy, etc.
2. Bizarre behavior or mannerisms.
3. Preoccupation with unusual religious or philosophical ideas.
4. Withdrawal from contacts with others.
5. Unexplainable depression or euphoria.
6. Delusions of persecution or grandeur.
7. Response to auditory hallucinations.
8. Mistaken perceptions of the environment — ideas of reference.

If the patient is seen early in a mental illness, every effort should be made to see that he is evaluated by a psychiatrist quickly and a decision made as to the diagnosis and the recommended management. A decision also should be made regarding the patient's employability. A psychotic employee is not necessarily unemployable. If his symptoms are well enough circumscribed and fixed and do not interfere with his everyday functioning, under some circumstances a psychiatrist may consider the patient employable while he is receiving treatment on an outpatient basis.

If a recommendation for treatment or hospitalization is made, the patient, his closest relatives and his family physician should be informed of this decision. Appropriate steps should be taken to see that the patient is followed up adequately.

Acute psychiatric emergencies may come about in numerous ways.[4] In each case there is a transformation of pathological thought and feeling processes into pathological action. The abnormal action may be manifested in excitement states, as in schizophrenia or manic-depressive psychosis. It may appear as severe depression, with danger of suicide. Other symptoms, such as severe anxiety, phobias, obsessive-compulsive states, and conversion hysterias, certainly require attention, but less urgently.

The most spectacular and frightening manifestation of mental illness encountered by the industrial physician is the acute panic state in the paranoid schizophrenic employee. "Someone going berserk" is a cry that causes consternation everywhere. One must always remember that the patient himself is far more frightened than those who are trying to deal with him. He suffers from the delusion or false belief that those around him are trying to harm or destroy him. In actuality, the patient has powerful unconscious thoughts, feelings, and impulses that are totally unacceptable to him. Ordinarily, he is able to keep these thoughts and feelings in check, but when they become overwhelming and move toward the surface of consciousness, the mechanism of projection comes into play as a defense against the unacceptable thoughts. He perceives the thoughts and feelings as being directed toward him from other people. He becomes panic stricken when he senses the overwhelming intensity of these mental phenomena. He tries desperately to protect himself from danger, and he may strike out at his imagined persecutors.

Proper management requires speed and firmness. Restraint by violence is to be avoided whenever possible. Not only is it inhumane, but it tends to amplify the patient's already overwhelming fears. He should be made aware that the physician knows of the serious nature of his problem, and that everything will be done to protect him from harm. Sometimes it is necessary to call in the police to prevent the patient from doing severe damage to himself and others.

The next step is, in many ways, the most difficult. He must be removed to a safe place. Ideally, he should be taken immediately to the admitting service of a mental hospital which is prepared to deal with him most effectively. Frequently, however, considerable confusion arises as to the mechanism for accomplishing such an emergency admission. It is important for each physician to be familiar with the emergency psychiatric facilities and the means of transportation available in his community. There should be posted in the office of the medical department a list of names and telephone numbers of key people to call upon in a psychiatric emergency. This list should include:

1. The local psychiatric hospital and its administrator or admitting officer.
2. An ambulance service which is prepared to transport acutely disturbed patients.
3. The nearest police station and its commanding officer.
4. A psychiatrist who is available for urgent consultation and advice.
5. A responsible public official, usually the county prosecuting attorney, who is empowered to order the involuntary confinement of a mentally ill person.

In addition, the physician should have on hand a supply of prescribed legal forms for certifying the patient as mentally ill and in need of emergency hospitalization.

Controversy often arises between the medical profession and the legal profession regarding the procedure in emergencies. The statutes almost seem to be designed to frustrate the doctor who is eager to have his patient confined to a hospital quickly and easily. One must remember that the individual retains the right to freedom until it is taken away from him by due process of law. This may be inconvenient for the busy doctor but it guarantees to the patient his constitutional right. The procedures vary in different jurisdictions.[5] There is at present a movement in many mental health societies for the revision of statutes or the introduction of a standardized Mental Health Act which insures that the patient is treated as promptly as possible without infringing upon his civil rights.

Some physicians have expressed anxiety that they might be sued for malpractice or be subjected to other civil action on the part of disgruntled patients or families following the restraint or commitment of a patient. When the physician acts in good faith and according to his best medical judgment and ability, he should not run into any trouble. He should take care to fill out the proper forms and to inform the proper authorities. He should not transport the patient to a hospital himself, and he should not have any proprietary interest in the hospital where the patient is confined.

Many physicians have had the frustrating experience of calling the police to handle an obviously disturbed or confused patient and have the policeman refuse to take the patient into custody or to transfer the patient to a psychiatric hospital. In general, a patient may not be taken into custody by a policeman solely on the basis of the physician's statement that the patient is mentally ill. After all, the poor fellow has not committed any crime. On the other hand, if the patient has committed a crime such as assault or destruction of property, or seems intent on committing a crime such as assault, homicide, or suicide, the policeman may take him into custody. He may then be transported by the police to a mental hospital at their discretion and held for a brief period of time (in the State of Michigan for 48 hours). During that time, the proper procedure for commitment may be instituted.

In the various jurisdictions there are different procedures for the involuntary confinement of a mentally ill person who has committed no crime. Generally, there is a method of obtaining a court order for holding a patient in a hospital for a few days. In order to have a patient committed for a longer period of time, a petition must be filed in the appropriate court. The patient's family usually files this petition. If the patient has no family, or if his relatives refuse to file a petition, other interested persons may file instead. The interested person might be a physician, or the employer or a labor union, among others. The judge would determine whether the petitioner had a legitimate interest.

After a patient has been committed to a mental hospital and has been discharged on convalescent leave, he occasionally comes back to the industrial physician carrying a note to the effect that he can return to his usual work, or light work or part-time work. This sort of recommendation reflects a lack of knowledge on the part of the hospital psychiatrist. Often there is no such light work or part-time work or nonstressful work that the patient can return to. Even if there were, he is still under the jurisdiction of a court and the employer may refuse to allow him to return to work. In many states he cannot obtain a driver's license, nor is he legally responsible for his actions until his rights have been completely restored by the court. These medicolegal problems are trying for the industrial physician. Their solution requires teamwork on the part of the medical and the legal profession to develop new laws.

There is another type of acute psychiatric condition seen by the occupational physician

which usually gets little attention until it is too late. Abnormal emotional response to injury is often recognized but seldom treated. When an employee is injured on the job he always gets the best medical and surgical care. He may be seen by a number of consultants who examine and treat him with the finest methods available. Yet prolonged suffering and absence from work go on, sometimes in spite of all this medical attention. The medical expense to the company and the compensation costs become increasingly burdensome. Only after exhausting every possible means of physical diagnosis and treatment is the patient referred to the psychiatrist. When referral is delayed for months and sometimes years, the effectiveness of psychiatric consultation is very much reduced. It seems senseless to put the psychiatrist at the bottom of the consultation list when in the proper cases he can be of most help when he sees the patient very early in the therapeutic process.

Most of the trouble starts with the patient's pre-existing personality.[6] Whatever psychiatric abnormalities exist make it impossible for the patient to feel or act appropriately under the severe stress of injury. Every physician in industrial practice is familiar with patients who have disabilities exceeding those anticipated from an injury. It is my contention that these disabilities are preventable or can be dealt with more efficiently if the psychiatrist is called in very early in the case. Some injuries, therefore, can be regarded as psychiatric emergencies just as they are surgical emergencies.[7]

Many physicians have expressed disappointment in trying to obtain emergency psychiatric consultation. The psychiatrist in private practice tends to be rather isolated, and most of his time is taken up in prearranged appointments. It is frustrating to be told that the consultant cannot see the patient for several days or even several weeks. Everyone seems to run into this situation and so far there are few satisfactory solutions. A few corporations are fortunate enough to have full-time psychiatrists in their medical departments. Many more employ the services of part-time psychiatric consultants.[8] Some large companies have expressed an interest in having psychiatric service readily available, but so far little has been done toward implementing such plans.

Perhaps the ultimate resolution lies in the establishment of independent cooperative psychiatric clinics. The idea has been tried in New York, Boston, and other cities with considerable success. An industrial community psychiatric service can be established and supported by a number of corporations and used by the participating companies for consultation and advice. Several psychiatrists in practice might join together their part-time services in order to provide a continuous and consistent level of availability. The eventual possibilities are quite exciting. A cooperative clinic might serve the following functions:

1. Diagnostic Functions

(a) Acute problems — Psychotic breakdowns, anxiety reactions to injury, acute suicidal depressions, etc.

(b) Chronic problems — alcoholism, recurrent psychotic reactions, psychiatric component of "functional" disorders, reinstatement following hospitalization, character disorders, etc.

2. Referral Functions
   (a) To private physicians
   (b) To community agencies
   (c) To psychiatric hospitals
3. Mental Health Maintenance Functions

Consultation Education Advisory	to	Medical Department Personnel Department Management

It requires the cooperative effort of management, the industrial physician, and the community physician to recognize mental illness early, to treat mental illness effectively, and to work toward preventing prolonged disability.

Summary

The industrial physician must be aware of the premonitory signs of mental illness. He should be prepared to deal with the acute psychiatric emergency quickly and effectively by being familiar with psychiatric consultation and hospitalization facilities in his community. He must know the essential legal procedures in his own state for commitment of a patient to a mental hospital. Abnormal emotional response to injury requires urgent psychiatric attention instead of postponement of psychiatric consultation until after all other specialties have been explored.

Psychiatric consultation is difficult to obtain in many communities on an emergency basis. The solution may rest in the establishment of cooperative psychiatric services supported by several companies, employing several part-time consultants to provide continuous coverage.

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Involutional Reactions Following Occupational Injuries in the Middle Aged

In the past few years patients suffering from chronic involutional reactions following occupational injuries have been presented to the authors for evaluation. These reactions had received practically no attention despite many examinations and hearings over a period of years of disability. This seemed unusual since emotional factors have been generally considered important in occupational injuries. Such terms as "psychogenic overlay," "neurotic coloring," "unstable personality," are common in court and workmen's compensation hearings. There has been tacit acceptance of emotional background features in work injuries, particularly when the degree of traumatic disability was excessive or prolonged. It was believed even more unusual that no specific work has been reported on this subject although some study in closely related problems has been undertaken.

Analysis of older worker adjustment to labor market practices by the U. S. Department of Labor shows that an ever increasing number of the middle aged are working.[1] Industrial studies have indicated a growing demand for planning, training, and preparation for retirement.[2,3,4] A depressive retirement syndrome was recently described by Johnson.[5] He noted that very little attention has been given to this condition even though there were potentials for marked disability. The insurance industry has shown a strong, if fiscal, interest in the problem as noted by Black.[6] A closer relationship to the case material to be presented was found in the study of illness in the aged by Kleemeier.[7]

In his work, "Aging and illness were felt to be identical and compounded existent emotional trends." Mention was made that "Experimental investigation in this area is almost non-existent." A recent British study of accidents in the aged by Boucher indicated that "Old people were prone to accident," yet a quotation from a chief factory inspector's report was given to the effect that the aged had a lower accident rate than the younger workers.[8] However, no emotional or involutional disabilities were mentioned and it was apparent that the proneness was for non-occupational injuries. The risks of hazards in employing middle aged people probably are not greater than in the general labor force, if proper attention is given to the known features of aging. In the cases to be presented special problems for investigation and therapy seemed to be indicated for the involutional reactions following, but set apart from, the traumatic factors. Most of the patients were seen only for evaluation and estimation of the disability and for purposes of establishing the usefulness of lump sum settlements.

Case Studies

1. R. V., a married woman, in the fifties, had high school education and was a secretary.

Injury: Three years before the present examination, patient had been working at her secretarial job for about three months, when she was accidentally struck over the scalp by a loosened 2x4, falling from a doorway. She was momentarily dazed and prostrate for several minutes and claimed that immediately following this injury she began suffering sharp or aching pains across the vertex of the head, feelings of unsteadiness, and generalized weakness. She felt much worse with any change in posture. She consulted her family physician a few days after the injury and kept up treatment with him for about two years thereafter at varying intervals. In the meantime, patient was examined and observed, was in and out of hospitals, had repeated skull x-rays, pneumoencephalographs, electroencephalograms and neurosurgical consultations. In all of these no positive findings were discovered. She continued to complain of headaches, dizziness, unsteadiness, and had not been able to return to any type of work. She became progressively more distressed about her condition and professed inability to carry on any type of domestic or social pursuits. Analgesics, sedatives, tranquilizers had not been helpful.

Background: The patient had been a secretary continuously for about 20 years. Her work was interrupted for six years due to her son's illness which necessitated her moving to a rural community from a large city. She had undertaken her present job at the insistence of the employer who was also a good friend. She had been postmenopausal for about six years but disclaimed any disturbing symptoms.

Examination: The patient was found to be pale, troubled, depressed, moderately thin, and staggered momentarily at practically any change in posture. She almost fell when called upon to bend, at which time she suddenly blanched, sweated profusely, and felt very weak. She was otherwise noted to be fearful at times and quite dejected when talking about her symptoms. She insisted that she had always been energetic and happy, before and throughout her marriage. Her general intellectual and cognitive levels seemed to be above average. She denied any previous mood disturbance and any excessive ambitions. Since the injury she had become increasingly depressed and seemed to be feeling entirely hopeless and useless in her home or in any type of activities, which she now shunned. There seemed to be a feeling of fear in the midst of any gathering because she was always anticipating some type of "black out." Pessimism was constant. She demonstrated a moderate amount of hostility to the employer and felt that she was now relegated to the role of a passive invalid state because of the accident. She insisted that there had been negligence and then indifference on his part concerning the accident. External signs of tremulousness, tearfulness, sweating, and agitation increased during the time of the examination. After the present examination the symptoms persisted and a picture of semi-invalidism with complete protection by family members for several years was reported.

Comment: Patient had been in the menopausal era at the time of injury and thereafter suffered activation of involutional trends.

Residual post concussion factors were believed to be minimal as were the conversion symptoms. There was a marked predominance of reactive hostility to her employer, depression with agitation, and a state of nihilistic withdrawal.

2. L. T., a married woman in the fifties, had been widowed about 10 years prior to present injury. She had grade school education and practically no work history.

Injury: One year before present examination patient was working as a nonskilled hospital laborer. In the course of her duties she had reached up to put on a light at the head of some stairs in the hospital when she fell down six or seven stairs and became wedged in between the wall and open stairwell. She claimed that she was immediately hospitalized and was unconscious for the rest of that day. She consulted and was treated by orthopedic and neurologic surgeons. The neck was placed in traction for about two weeks and a neck brace was worn for a number of months thereafter and she still wore it during sleep. She was bedridden for a number of months and was unable to use the left upper and lower extremities until approximately a month prior to the present examination. Thereafter, she had almost continuous aching pains throughout the whole head that required much analgesic and sedative medication both day and night. She felt weakness of the hand grip and of the entire left upper extremity. Frequent shooting pains radiating from the neck down to the left foot were repeatedly suffered together with tremulousness and weakness of the entire left side. She noted that the right side was similarly involved but to a less intense degree. She also had noted a disturbance in appetite with a marked loss of weight, and numerous unrelated pains throughout the back, chest, and abdomen.

Background: The only pertinent information was that she had undergone a hysterectomy shortly before present occupation. She had been leading a moderately withdrawn, almost seclusive, existence throughout the time of her widowhood and seemed to rely exclusively on a neighbor who wanted to accompany her everywhere.

Examination: The patient was very pale, appeared aged, and was extremely restless and tremulous through the entire examination. Neurologic findings including nerve testing and EEG studies were entirely normal. She displayed a noncharacteristic tremor of the upper extremities with frequent voluntary flailing movements of both hands at any type of exertion. She shuddered or shivered and suddenly cried out while grasping her left arm or shoulder as though in sudden pain when asked for any type of body movement. There was marked hypasthesia through the entire left side of the body from the scalp to the feet and she had to be urged even to turn to the left. All movements, however, were freely executed but pain seemed to accompany any type of trunk or neck movements. Very frequently a number of purposeless squirming movements were seen. She seemed generally very fearful and had to have frequent reassurances from her friend who had accompanied her. Her entire conversation was made up of somatic symptoms with more and more elaboration of discomfort as the examination wore on. She frequently grunted and gasped for breath as though she had spasms of the abdomen. She acknowledged that her life was made up entirely of these symptoms and fears. She insisted that she would

forever be unable to conduct any type of normal existence, and that she was far too involved with pain to think of anything else. She denied any active or severe depression, but admitted a constant state of urgency and agitation, which seemed to require more and more sedation. She felt her employer to be entirely responsible for the injury, repeating this many times, and felt that she had been utterly neglected and would never get better despite the considerable amount of medical and surgical care.

Comment: In all probability, cervical and possibly lumbar strain had occurred, with no objective neurologic damage. Certain conversion features were evident, but the marked agitation, nihilism, urgency for attention and dependency on her friend, together with the hostility toward her employer, seemed to fill her life completely. The pre-existing dependent, withdrawn personality, the hysterectomy, seemed markedly to intensify and prolong this involutional agitated reaction. The condition has not changed in the three years following the examination.

3. E. G., a divorced woman in the forties had three children. She had no formal education, and was a glove factory worker.

Injury: Patient had been employed as a glove worker for about six years prior to injury and was seen for present examination about seven years afterward. While at her regular work, a flash explosion of some type of glove edging fluid occurred near her. She suffered first and second degree burns of both hands, abdomen, and lower extremities. She was treated by her family physician for about four years thereafter. She had refused more specialized type of plastic surgery for the burns because she would not leave her home town and be away from family members. She claimed she suffered from extreme sensitivity of the involved areas of the skin during cold weather and on taking moderately warm baths. Symptoms consisted of severe prickling and cramping sensations, especially of the lower extremities, that she claimed also turned blue. A considerable number of local applications as well as sedative medications had been administered. She was still under the care of the family physician who it was reported had frequently urged her to undertake plastic surgery.

Background: The patient had had a hysterectomy about 15 years prior to the injury, with intermittent menopausal symptoms occurring ever since. She also had other pelvic operations, cholecystectomy, mastoidectomy. She had suffered fairly severe marital problems that eventuated in divorce. Many behavioral problems arose with her daughter almost coincident to the injury. A long process of litigation went on for the custody of patient's grandson throughout patient's convalescense. This was a source of considerable apprehension to her. The patient herself had been brought up in an orphanage with seven siblings, following separation of her own parents. However, she had been working intermittently at moderately exertive laboring positions most of her adult life.

Examination: The patient was noted to be a rather thin, wan, middle aged appearing woman, who eagerly displayed her healed burn scars. She manifested a considerable amount of restlessness mounting almost to agitation as she did so. General intellectual functions were of rather low caliber but there was no disturbance in sensorial functions, or in stream of thought. She listed her many interpersonal difficulties and felt more and more that her work had turned against her and that she would never again achieve any type of happiness. There was marked indecision about her future and yet she wished to remarry as soon as possible. During the examination, in her agitation she was seen to rub and scratch the areas of her burns very frequently, and she admitted that she did this instead of using prescribed ointments. She also noted that she frequently inadvertently bumped herself and bruised these particular areas. Depression and fearfulness had mounted in the past few years, and she was continually anticipating that the burned areas would break down again into ulcerations. There were no particular personal interests, her entire life being centered about the care of her grandchild and an aging mother. The removal of her grandchild shortly before present examination had brought on a picture of acute depression. She noted that she had been unable to do much work or exertion of any type for the past few years, because of the intense feelings in her limbs and in her abdomen. A certain amount of dependence as well as hostility to the employer were presented although she admitted a contributory negligence on her part in that she had refused more expert plastic surgery. As far as she was concerned, the entire situation was hopeless.

Comment: It was felt that patient had suffered from painful burns which were healed long before the present examination. The real disability was the emotional upheaval in the course of her convalescence. The serious involutional reaction developed in a limited, rather vulnerable person who had replaced a marginal troubled existence with dramatic symptomatology.

4. J. G., a married man in the fifties with practically no formal education, was a heavy laborer and part-time store owner.

Injury: Approximately two years prior to present examination patient had been employed in seasonal lumbering work. He was engaged in

this through the lumbering season. To avoid being struck by falling timber he underwent a sudden straining in his posture. At the time he felt "tightness" in the lumber and dorsal regions as well as in the gluteal musculature. However, he was able to work through the rest of that day and the following day. The third day after the injury he noted increasing low back pains with weakness of the back and legs and was unable to work thereafter. He was treated by his family physician with various types of physiotherapy, and then undertook osteopathic treatments without relief. Shortly after the injury he claimed increasing nervousness, shaky feelings, fearfulness, and frequent episodes of pain radiating from the lower back to the dorsal and neck regions, causing him frequent headaches and pressure feelings in the occipital region. In the year prior to examination marked insomnia, poor appetite, and inability to do even minor chores had developed.

Background: The patient had no pertinent features in his background except that of relatively marginal existence and moderation in his general habits. Apparently, he had very little loss of worktime for 30 years prior to the present injury. In addition to the seasonal type of work, he and his family had tried to set up a store, which failed, and they had a small family farm.

Examination: Patient was a wiry, elderly appearing man who showed much tension and uneasiness with expressions of depression and agitation. Neurologically, patient displayed a noncharacteristic distorted type of gait with a bouncing limp of the right foot, keeping the knee and ankle somewhat flexed. He was unable to walk downstairs in a straight, normal manner, and on walking upstairs he displayed a bizarre sidewise type of gait, in which he had to pull himself up by the railing hand over hand. No objective neurological findings could be elicited. Subjective pain was elicited on mild trunk, limb, or neck movements with sudden grasping at the right lumbosacral region. As the examination went on, facial and postural expressions of agitation and depression increased. He gave considerable details about his symptoms but he spent more and more time in discussing how poorly he was getting along financially and how his fellow workmen, for whom he had fraternal feelings, had rejected him following the injury. A number of contributory emotional features were eventually revealed. At the time of the injury, his wife was ill with both surgical and emotional conditions and he had not been able to get along with her for several years, had not even been able to discuss his own injuries with her. At the same time there were family disturbances regarding the behavior of his daughter, for whom he felt much anger, hostility, rejection, and agitation. He had thus developed a picture of continuous frustration, sorrow, resignation, and over-all feelings of hopelessness with ever increasing somatic symptoms. He became noticeably more and more agitated in the discussion, and he demonstrated a marked reaction of severe pain and stiffness in the neck in that he held on to his neck in a tense manner and for some time was unable to make any other movements. He admitted a progressive detachment from any type of outside activities and disclaimed any interest in his wife and family. He knew that he was depressed and agitated, but he attributed this to the results of his injury and to the neglect or rejection by his employer and fellow workers.

Comment: The physical signs were felt to be of hysterical type and bore no organic relationship to the injury. Rather clearcut marital and family discord, leading to increasingly severe involutional reactions were felt to be the true basis for patient's disability.

5. J. S., a married man in the sixties had practically no formal education. He had spent practically all of his adult years in some form of lumbering work, always residing in the backwoods.

Injury: Patient was seen approximately three years following the present injury. He was log-rolling when he slipped from a log, lost his balance and fell, striking his back on a nearby stump. He was put under medical care immediately and since then had received physiotherapy, several braces, and much medication. He had repeatedly attempted to work at one or another type of supervising job that required very little exertion but was unable to continue because of recurrent midlumbar pains and increasing tremulousness of trunk and right lumbar region to the right lower extremities. At times he had sharp radiating pains through the right lumbar region to the right lower extremity, frequently associated with numbness and weakness of the right leg. Whenever he attempted mild exertion he became "shaky" and weak. He described a bizarre set of maneuvers which he claimed were necessary in order to be able to walk straight. The condition was allegedly getting worse.

Background: Patient had a history of numerous accidents in the course of his work with variable losses of work time. At one time he had been blinded in the left eye due to a splinter and had suffered fractured ribs due to falling logs. However, he indicated that he always returned to work as soon as he was able after each injury. He indicated that he never maintained a home life and had no interests or recreation.

Examination: Patient was thin, wiry, much younger appearing than his age. He was restless, uneasy, and quite dejected. Comprehension

was poor as was his speech and language. Neurologic features were not remarkable. He was able to do full leg and trunk bending but any type of trunk movements brought out tremulousness beginning in the trunk and extending to the limbs. He claimed a constant feeling of annoyance and disturbance together with fears of pain at any type of activity. He felt he was unable to do anything with himself any more. He knew now that he suffered from the lack of any family basis and gradually brought out details. His three living children had left home early in their lives and there has been no contact with them for years. He thus lived more or less alone and now is constantly preoccupied by fearfulness, uneasiness, and tremulousness. He was sure that he could not sit or stand too long in any position without pain or stiffness. He insisted that all he wanted was to be taken care of and at the same time that he should be able to maintain some status with his fellow workers. He felt that the latter were not only rejecting him but ridiculing him. He noted difficulty in sleep due to his generalized shakiness and felt that he was now a ruined, helpless man. He had no interest in existence except logging work, and if he were unable to do logging he felt he might just as well die.

Comment: This patient had suffered a moderately severe back sprain or strain with subsequent osteoarthritis. However, the chief disability was felt to be due to complicating or superimposed involutional features that were of far greater importance than the back injury. The limited personality and lack of any but occupational attachments served as primary factors for development of increasing involution. It was also felt that his more superficial conversion symptoms substituted for the previous status he had maintained with fellow workers.

6. A. R., a married man in the fifties, had been a dairy farmer and a machinery laborer. He had only a few years of school.

Injury: Patient had been employed as a laborer about one year before the injury, and the present examination was seven years after injury. He was injured by trying to catch a heavy piece of machinery to prevent it from falling. In so doing he strained the right shoulder girdle and thereafter suffered increasingly severe pains through both shoulder areas. Pains became more frequent and sharp, radiating through both upper extremities. He developed weakness of the right arm with numbness of the thumb and index finger. Frequent radiating pains from the neck to the right deltoid and scapular region were noted at any exertion of the trunk and at jarring or straining. He claimed poor coordination of the right upper extremity. Treatments by medications, physiotherapy, manipulations, and sedative measures had been maintained until the time of the present examination.

Background: Essentially normal vocational and background history; the patient had been a dairy farmer but suffered severe financial reverses in his farm business and thus took on the job.

Examination: The patient was a small-statured, thin, very depressed looking man. Neurologic findings were negative objectively. Subjectively, he noted numbness in all of the digits of the right hand and seemed voluntarily to hold his neck rigidly toward the left, walking with a certain amount of list. The latter was dispelled when attention was called to some other direction. The external appearance of depression could be changed by describing and elaborating symptoms. At these times he became quite animated. He seemed to develop an increasing amount of symptoms as the interview wore on. Some of the symptoms included frequent twitchings with soreness of the right side of his face, soreness inside his mouth, increasingly poor eyesight, and more and more restlessness, particularly at night. He claimed frequent periods of nausea and gastric disturbance following any type of exertion. He complained also about decreased sexual ability and made numerous references to his young appearing wife. He insisted repeatedly that he had become nervous and irritable because of relative impotence which he then ascribed to the instant injury. He tearfully compared himself to his parents who had lived a vigorous and energetic life to advanced years. He repeatedly condemned himself and his employers for the injury, on the one hand that he was stupid enough to take such chances, and on the other hand that his employers had not given him sufficient consideration for his attempt to save an expensive piece of machinery. Since the time of the injury a fortunate development occurred, in that the family banded together to purchase a small farm, which he was permitted to supervise. In this respect he felt that he was of some usefulness to the rest of his family. However, he was still depressed and claimed the symptoms he described were of sufficient importance to interfere with even this function, and he has found it frequently necessary to seclude himself.

Comment: It was felt that in all probability this patient suffered from a herniated cervical intervertebral disc, with superimposed arthritis. However, the picture of conversion symptoms together with marked involutional coloring had developed more importance than the original injury in the total pattern of disability.

7. A. M., was a divorced man in the fifties with high school education. He had been a factory foreman.

Injury: Approximately 11 years prior to the present examination, the patient complained of a confused episode that was believed to be due to over-work, long hours, and pressures of his duties. He had been working for a number of months "seven days a week," and had complained of increasing tiredness, uneasiness, agitation, and insomnia, together with frequent attacks of emesis. At this time he remained in bed for about six weeks, then resumed the same work. About five years prior to the present examination, he collapsed after a sudden amount of exertion, due to pushing some loaded trucks to get work through on time. He suffered an alleged attack of hemoptysis of questionable amount. He claimed that from that time on he had to spend much time in hospitals and various doctors' offices and in a state of semi-invalidism, frequently resting up at a local farm.

Background: Patient gave a history of devoted protective attention to his widowed mother for 20 years before her death. His parents had broken up his early marriage and he never remarried. (He had always been noted for his scrupulous attention to dutiful details, and he had practically no outside activities or interests, spending almost all of his time in work or in domestic chores and in the care of his mother.) He had had his present job over 20 years.

Examination: Neurologic and EEG findings were normal. Patient was found to be a thin, sallow, but well built man, of middle age appearance. Throughout the interview he presented a calm, smiling, affable exterior. This was in marked contrast to expressions of worry and apprehensions for the future. He claimed that he had always been very ambitious and could not see himself in this present invalid state for the rest of his life. He insisted that he had suffered a severe heart attack as a result of overwork, and that the company was certainly negligent in allowing a man to work so hard. He was able to consider his financial situation quite logically but felt himself hopeless as far as any type of work or any other interpersonal relationships were concerned. He went into many details of his numerous medical examinations and care and enumerated over 20 physicians and specialists and a number of prominent clinics throughout the country where he had been examined. He described general feelings of weakness and has had to spend much time in bed. He also claimed frequent episodes of exhausting cough, together with much unsteadiness in gait. A considerable dependence on family and friends developed in the course of his illness, and he felt that his employer must be made responsible for his present difficulties and expenses. He repeatedly stated that injustice had been done to him because ordinarily he would have retired at this stage of employment and instead has had to lead a disabled type of existence. He brought out the fact that he was noted for his scrupulous attention to duties at home and work. He gave up all his interests to spend time taking care of his mother. Now his life was ended because of such devotion.

Comment: The physical findings were minimal for his prolonged disability symptoms. The disabling involutional pattern seemed to be based on a life of obsessional devotion, reactive aggression to the employer as a parental figure, and, finally, regression.

8. H. G., a married woman in her sixties, claimed business college education but had had only intermittent low level factory jobs.

Injury: The patient was injured approximately one year prior to the present examination. She had been employed at the same job intermittently for five years. (She undertook such work in order to supplement the reduced family income that was due to progressive arthritic disability on the part of her husband). She was at work inspecting and dispatching gloves at a bench, when a loaded hand truck struck her table, propelling it into her left thorax. She was knocked over backwards striking her back on a nearby table. On being assisted to the rest room immediately afterward, she had nausea and emesis. Immediate attention at the office of a nearby physician was obtained. She claimed the physician told her that she suffered internal injuries and that she had to rest. She was treated with diathermy and medications for the next year. However, she continued to feel frequent pains in the thorax, neck, head, and face with frequent episodes of emesis. She was unable to eat solid foods and gradually began to feel more and more agitated about her condition. During this time, hospital observation, x-rays of the abdomen, back, heart, and thorax were found to be essentially normal. The symptoms persisted, and seemed to increase gradually in number and intensity.

Background: No pertinent features could be ascertained. Patient had worked at her present job about five years.

Examination: The patient was found to be a rather agitated, tearful, middle aged appearing woman, who had apparently withdrawn from any type of personal or social activities within the past year. During this time, both the patient and her husband had been leading a semi-invalid existence. Repeated physical and other examinations which were described to her, as well as a number of hearings, served only to build up her case. As she described these events she became animated and almost oratorical. On further questioning she described an existence limited in score, intellection, and interests despite her level

of education. Following her injury more and more tension arose between patient and her husband so that their lives are apparently spent in belaboring each other with symptoms. Increasing somatic fearfulness and mounting depression with irritability were apparent. This patient was treated by psychotherapy and sedatives for about six months. Some improvement in mood developed, but she still expected a lifetime of compensation benefits.

Comment: Although the factors of secondary gain were operative, the use of the litigation procedures for dramatic self-importance was impressive. Depressive and regressive dependence occurred as these procedures were set aside. Of particular interest was the picture of the patient and husband both using their disabilities as a way of life.

Comment

The cases presented in brief illustrate fairly clear involutional reactions, depressed or agitated types. Causal relationship between occupational injuries and early conversion symptoms is generally well known and needs no comment. In most of our patients, such symptoms were seen and probably were part of the traumatic picture. The development of involutional symptoms, however, were believed to be more of an intrinsic personality reaction, set apart and yet serving as the main source of chronic disability. In our work no attempt to study the deeper dynamic features could be undertaken because the contacts were designed only for evaluation. There were available complete medical (and litigation) histories that emphasized in many instances that formidable amounts of medical and surgical care had been devoted to these patients. The organic symptoms had been adequately treated and were either recovered or arrested. Again in most instances, psychiatric features were noted but without elaboration and were described early in the course of the picture so that insufficient attention was given to the possible development of involution.

Tentatively, it was noted that a certain pattern evolved that eventuated in the disabling involutional changes. At first, the patient seemed to suffer emotionally because of financial losses. This was a realistic problem throughout and may have played some part later in certain aspects of secondary gain — or as a punitive measure against "the company" for their alleged negligence. Later still, the award was felt to be only a token or symbol of conflict. It was not the main issue, nor was it ever presented as a solution. As time went on the patients began to miss the feeling of self-importance that they had maintained as a result of their work. In fact, on closer observation, their jobs seemed to be their only source of satisfaction.

The dramatization of the withdrawal from a vocation that had given purpose and usefulness to an otherwise narrow, restricted, or even compulsive personality was impressive. When such work had stopped for a long interval an increasingly intense introspective process developed which brought out the personal limitations and elaborated the somatic complaints. Patients that had worked for many years in the same company or at the same type of work usually developed a strong identification with the "company." They "had given the best years" and were cast aside and felt "no one cared anymore." When lighter jobs or retirement was proposed, the feelings of rejection were intensified and withdrawal from former fellow employees was added to withdrawal from what family attachments they had. Involutional aspects would mount at this point and nihilistic tendencies, irritability, and agitation became significant. Somatic and litiginous preoccupations seemed at times to energize or lift the more depressive reactions. The processes of examinations and hearings made for colorful or intense upheavals, and frequently involved a number of family members and different lawyers.

Enrichment and increased importance to their lives were thus manifested. The challenging of a symptom or of the degree of disability, the delaying of a compensation check, and even attempts to "settle" brought forth almost explosive condemnations. Although much of the latter may also be noted in any post traumatic condition, in the middle aged it is followed by deepening depression, nihilistic, and akinetic trends. Any probing for background data would also result in the same picture. The abandonment of examinations, of long continued physiotherapy, and also of hearings added to feelings of hopelessness. Actually, the prolonged orthopedic, medicinal, and similar measures had served to support the very symptoms that the patient had used to cover up deeper involutional reactions. These would readily appear after the supports were removed.

In most of our patients the clinical picture fitted the framework of the retirement syndrome described by Johnson,[5] and this included in many respects the premorbid types of personality. However, the premorbid neurotic defenses described by Johnson were in our cases associated with the immediate traumatic situation in the form of conversion reactions. The latter eventually served the purpose of holding off or diverting at least temporarily the depression and agitation. Although insufficient dynamic material was obtained, enough details from the life patterns were noted to indicate inadequacies, inferiorities,

and prominent conflict situations that came to the surface as the job, work, became more and more distant. Certain psychological specifications regarding illness in the aged noted by Kleemeir[7] were parallel to our findings. He outlined, admittedly in brief, such reactions as regression and frustration with reactive hostility to the most available person (physicians, relatives, "the company," and the people of the hearings). Whereas Kleemeir felt that chronic disease with aging served to increase conflicts until depressive symptoms could no longer be submerged, in our work conversion reactions were evident until depression-agitation set in.

The problems of therapy and rehabilitation in these cases could not be dealt with, but in view of the potential duration of disability they assume considerable importance. The indemnifying carrier, the usually numerous consultants, and the legal personnel have been involved only in the disposition of the case. The problem, presented to courts, is the decision regarding the part of the picture that is traumatic in origin. The involutional reactions in our patients were considered as set apart from the traumatic picture and progressed in an automatic manner, from intrinsic personality trends. However, the clinical picture was made impressive by the dramatic emotional displays and physical symptoms that did not seem amenable to medical or surgical measures. The patient apparently fosters the use of symptoms as a basis for demands and retribution. Anything that has been told by doctors and lawyers is brought up for contention. In this way important undercurrents of depression and other involutional trends are avoided. Everyone involved in such cases directly or indirectly contributes to the maintenance of symptoms — that actually may delay the involutional pattern.

From the therapeutic viewpoint, it is believed that the most important factors are the early recognition of involutional trends and the taking of steps toward prevention. When it is considered that these conditions have existed and may exist for a number of years and that the usual course of ordinary involutional processes take less than a year for rehabilitation, the factors noted above must militate against recovery. It is important to look for and suspect involutional processes as a concurrent, related event in any injury in a middle aged person when vocational pursuits are threatened. It is felt that the involutional features should be treated by established psychiatric methods and as a separate entity from the traumatic picture. The surgical aspects and physiotherapy, it is believed, should be definitive and applied as quickly and decisively as possible. Indecision or differences in opinion between examining physicians should be minimized or "arbitrated." It was noted that "heat treatments" were applied in some cases for several years; supportive belts or back braces, worn for several years, were noted to be almost ridiculously loose; analgesics, sedatives, and then tranquilizers had been taken daily for years — all of which indicated the marked conversions to somatic symptoms and were fostered inadvertently iatrogenically.

Mental hygiene activities that should be considered, particularly in industries or offices employing older personnel, are the setting up of periodic surveys and evaluations of the emotional status of older employees. This may call for much planning, but may start quite simply in two directions. First, a survey as to how these people are "getting along," indicating a direct interest in them and uncovering any pressing or disturbing problems. Second, an appraisal of any possible occupational dangers, with specific reference to their agility, alertness, and coordination in relation to these hazards. An awareness and appreciation of increased disturbances in injuries to middle aged people would go a long way toward the prevention of markedly prolonged disabilities.

Summary

A number of cases have been presented to illustrate the importance of involutional factors in prolonging disability following occupational traumata in the middle aged. The significance of increases in such cases in light of employment of older people was pointed out together with tentative suggestions for prevention and therapy. It was found that the clinical pictures of involution following occupational injuries in the middle aged were similar to the retirement syndrome and the reactions following illness in the aged. It was felt that this type of reaction warranted much more medical and legal attention and should be considered in every instance of prolonged or excessive disability in the middle aged.

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Late in 1960, the Supreme Court of the State of Michigan handed down a decision that promptly became a cause celebre. In this decision it appears that a claimant long recognized as mentally abnormal was awarded compensation in the absence of any accident or any episode clearly productive of the exacerbation of the abnormal mental condition. This decision has attracted such wide attention, notably among psychiatrists and industrial physicians, that some service may be rendered by the presentation in this Journal of the major portion of the Court's record.

Workmen's Compensation in Psychiatric Diseases

James CARTER, Plaintiff and Appellee,
v.
GENERAL MOTORS CORPORATION CHEVROLET GEAR & AXLE DIVISION,
Defendant and Appellant.
No. 20.
Supreme Court of Michigan.
Dec. 1, 1960.

Proceeding for workmen's compensation benefits for a psychosis resulting from emotional pressure encountered in daily work by machine operator, who worked on assembly line production, wherein there was medical testimony that operator no longer showed any symptoms of a psychosis but that he should not be employed again in production work but that he could be employed again. From an award of compensation by the Workmen's Compensation Appeal Board, the employer appealed in the nature of certiorari. The Supreme Court, Souris, J., held that where expert testimony indicated that machine operator had a personality disorder and a predisposition to development of a schizophrenic process, and operator sustained a disabling psychosis caused by emotional pressures produced by production line employment, he sustained a disability compensable under part two of the Workmen's Compensation Act, but that evidence was insufficient to sustain award of continuing disability after all evidence of a psychosis had disappeared.

Order affirmed in part and remanded with directions.

Workmen's Compensation

Compensation is payable under Workmen's Compensation Act for loss of earning capacity caused by a mental or emotional disability resulting from a physical injury to claimant or even resulting from observing a physical injury to a fellow employee of claimant. Comp. Laws 1948 and Comp. Laws Supp. 1956, § 411.1 et seq.

In proceeding for workmen's compensation benefits for a psychosis resulting from emotional pressure encountered in daily work by machine operator, who worked on assembly line production, evidence sustained finding of a causal connection between disability and his work.

Emotional disabilities are compensable under the Workmen's Compensation Act regardless of whether cause of such emotional disability is a direct physical injury or a mental shock.

Where expert medical testimony indicated that machine operator had a personality disorder and a predisposition to development of a schizophrenic process, and operator sustained a disabling psychosis caused by emotional pressures produced by production line employment, he sustained a disability compensable under part 2 of the Workmen's Compensation Act. It is not necessary to find an accident or a fortuitous event in order to grant an award under part 2 of the Workmen's Compensation Act.

The Majority Opinion

Souris, Justice: Ordinarily, compensation under our workmen's compensation act is awarded for incapacity to work because of the crushing of a hand or foot, the inhalation of silicotic dust, or other similar injury arising out of and in the course of employment. Benefits are not awarded for the injury as such, but rather for the loss of earning capacity. Hence, even this Michigan Court, years ago, recognized

the right of a claimant under the act to compensation for loss of such earning capacity caused by a mental or emotional disability resulting from a physical injury to claimant or even resulting from observing a physical injury to a fellow employee of claimant. In due course we shall examine the authorities so holding, including decisions of this Court made venerable by age and by the compelling logic of their reasoning, for it is upon those past decisions of this Court that our decision in this case is firmly planted. Our decision is that workmen's compensation benefits are payable for incapacity to work because of a claimant's paranoid schizophrenia arising out of and in the course of employment.

Plaintiff had worked as a machine operator for defendant, General Motors Corporation, with intermittent layoffs, since 1953. On October 8, 1956, he was recalled to work after a five month layoff and worked for four days on a "brace job" and then was transferred on October 12th to a "hub job." This operation required him to take a hub assembly (consisting of a case and cover) from a nearby fellow employee's table to his own workbench, remove burrs with a file and grind out holes in the assembly with a drill, and place the assembly on a conveyor belt. Plaintiff was unable to keep up with the pace of the job unless he took two assemblies at a time to his workbench, and he feared another layoff should he prove unable satisfactorily to do the work. He was instructed repeatedly by his foreman not to take two assemblies at a time because the assembly parts became mixed up on the conveyor belt when he did so. However, plaintiff continued having trouble "getting on to the job" as it was supposed to be performed. Thus, when he took only one hub assembly at a time, he fell behind; when he fell behind, he took two assemblies; but, when he took two assemblies, he got the assemblies mixed up and was berated by the foreman.

We are told that the dilemma in which plaintiff found himself resulted on October 24, 1956, in an emotional collapse variously described as paranoid schizophrenia and schizophrenic reaction residual type. He was subsequently hospitalized for a period of one month, during which time he received shock therapy. In July of 1957, he filed an application for hearing and adjustment of claim for compensation under the workmen's compensation act.

It should be noted that there is not involved in this case a psychosis resulting from a single fortuitous event nor is there involved a psychosis resulting from a direct physical blow to plaintiff's body. Instead, there is involved a psychosis claimed to be the result of emotional pressures encountered by plaintiff daily in the performance of his work.

The referee entered an award of workmen's compensation for a disability described as "traumatic neurosis, traumatic psychosis, functional disability and sequelae thereof." The workmen's compensation appeal board, by a divided vote, affirmed the award for total disability from October 24, 1956, until January 7, 1957, plus reimbursement for medical and hospital care. The appeal board, in addition, allowed to plaintiff continuing compensation from and after January 7, 1957.

Pertinent quotations from the three opinions filed by members of the appeal board follow:

1) CHAIRMAN MCLAUGHLIN: ". . . . Plaintiff sustained a personal injury arising out of and in the course of employment and due to causes and conditions characteristic of and peculiar to the business of his employer. . . . As the result of the injury plaintiff has been totally disabled since October 24, 1956, from doing the work he was performing for defendant prior to that date. Plaintiff cannot safely be subjected to pressures or strains. He is not able to perform work which is highly competitive or requires a certain production rate. Plaintiff is and has been since October 24, 1956, disabled from earning full wages at the work in which he was last subjected to the conditions resulting in disability."

2) MEMBER STORIE: ". . . . The disability is due to an aggravation of a pre-existing condition by more than one nonfortuitous event. I hold that disability is compensable under the provisions of Part II of the Workmen's Compensation Act and concur with Chairman McLaughlin in granting compensation. . . ."

3) MEMBER RYAN: ". . . . I do not agree that the plaintiff's disability is due to causes and conditions characteristic of and peculiar to the defendant's business. . . .

"There is nothing in this case identifiable as an occupational risk. . . .

"The job was a simple job and the foreman's instructions were even simpler. Nothing more emanated from the employment. . . .

"The disability arose out of the plaintiff's own feelings and misapprehension and from within himself completely."

The only medical testimony offered is that of the treating physician. He testified as follows:

". . . the patient saw himself as in an impossible situation in which he couldn't win. He couldn't please the foreman operating the machine in his job the way he was. If

he attempted to do it the foreman's way he would fall behind in his work and the men on the line would complain and the foreman would get after him for this. So he really felt himself caught in an impossible situation which had no solution. . . .

"My feeling is that Mr. Carter showed some evidence of instability earlier in his life; namely, this episode in the service when he went AWOL relatively frequently and was discharged for that reason. Apparently subsequent to this he was able to make a fairly satisfactory adjustment, but he managed to avoid situations wherein he felt trapped. For instance, he mentioned that on his construction job he was all over, that he worked in many different places. And apparently in his experience with General Motor too, he was never on a job where he felt he could not meet the demands of the job. Now, I feel that here we had an unhappy combination of circumstances, that after a period of a layoff the man comes into a new job which for somebody, I think, with the relative inflexibility of personality that this man had, required some adaptation. So that already he was working in a new position with which he was not familiar, and he found himself in a — as I believe I described it before, in what to him was an impossible situation. Namely, that he could not meet the foreman's demands and stay on the work doing it the way the foreman wanted him to do, and on the other hand, if he did keep up, then his job was threatened in that fashion. So he actually felt that the job which he had described to his wife as liking very much was threatened in either way. We frequently see a situation of this type where the person feels himself trapped in a situation that has no solution, at least to them, precipitating a schizophrenic breakdown. And I think the indications are that this is what occurred here. . . .

". . . . I think that he has had the personality predisposition towards the development of this illness for a number of years. This is what usually happens, but then there is the straw that breaks the camel's back, and they develop the actual psychosis in which they are out of touch with reality. Now, we have no reason to believe that he was before out of touch with reality."

This was competent expert opinion testimony, upon which the board could and did base a finding of causal connection. Such a factual determination is binding upon this Court, there being competent evidence to support it. McVicar v. Harper Hospital, 313 Mich. 48, 20 N.W.2d 806; Redfern v. Sparks-Withington Co., 353 Mich. 286, 91 N.W.2d 516, and C.L. 1948, § 413.12 (Stat.Ann.1950 Rev. § 17.186). It may be noted that the defendant offered no medical testimony to rebut that given in behalf of claimant by Dr. Lawrence P. Tourkow, a specialist in the field of psychiatry and psychiatric consultant to the public schools and the board of health of the city of Highland Park. The record discloses that Dr. Tourkow's professional qualifications as an expert witness were not challenged by defendant.

The second point, whether plaintiff suffered a disability compensable under the act, presents a more difficult question. This Court has previously held that emotional disabilities are compensable under the act. Klein v. Len H. Darling Co., 217 Mich. 485, 187 N.W. 400; Karwacki v. General Motors Corp., 293 Mich. 355, 292 N.W. 328; Hayes v. Detroit Steel Casting Co., 328 Mich. 609, 44 N.W.2d 190; and Redfern v. Sparks-Withington Co., supra. Whether the cause of such emotional disability is a direct physical injury (Redfern v. Sparks-Withington Co.) or a mental shock (Klein v. Len H. Darling Co.), we have held the disability compensable. What distinguishes the case at bar from our other decisions which recognize the compensability of such disabilities is that this plaintiff's disability was caused by neither a single physical injury to plaintiff nor by a single mental shock to him. Instead, his disability was caused by emotional pressures produced by production line employment not shown by him to be unusual in any respect, — that is, not shown by him to be any different from the emotional pressures encountered by his fellow workers in similar employment. As noted above, the finding of causal relationship between plaintiff's disability and the pressures of his employment was supported by the evidence. The question then becomes, must industry, under our laws, bear the economic burden of such disability? Implicit in the question as stated is the further question: Is a worker unable to work because of a mental injury caused by his employment to be treated differently from a worker unable to work because of a physical injury caused by his employment? Our answer may be found in this Court's prior decisions and in the decisions of other courts in other jurisdictions with comparable laws which have considered the problem.

We make no claim that it is universally held that a mental disorder which is precipitated solely by a mental stimulus, as opposed to a physical impact, is considered a compensable personal injury. There are those jurisdictions

in which no nervous disorder is compensable. For example, Star Publishing Co. v. Jackson, 115 Ind. App. 221, 58 N.E.2d 202, was a 1944 Indiana case involving a linotype operator who developed a recurring spasm in his left hand. Diagnosed, and proved, as an occupational neurosis caused by the antagonistic relationship between the claimant and his foreman, this disability was held not compensable. See also McGill Manufacturing Co. v. Dodd, 116 Ind.App. 66, 59 N.E.2d 899, for a similar holding.

In New Jersey, a stenographer was called an "idiot" by a co-worker when she misunderstood what she was supposed to do. This incident upset her, and she was subsequently treated for a nervous disorder. Her petition was dismissed by a referee in a proceeding under the New Jersey workmen's compensation act, for the following reason:

> "I am satisfied that the petitioner did not meet with an accident arising out of and in the course of her employment; in fact, there was not one iota of testimony to even suggest an *accidental occurrence*." Voss v. Prudential Insurance Co., 187 A. 334, 14 N.J.Misc. 791. (Emphasis supplied.)

The referee's reason for denying compensation is inapplicable in Michigan in the light of our recent holdings in Sheppard v. Michigan National Bank, 348 Mich. 577, 83 N.W.2d 614, and Coombe v. Penegor, 348 Mich. 635, 83 N.W.2d 603. The following holding by the Appellate Division of the Supreme Court in New York may be distinguished in the same manner:

> "The record here discloses that claimant became angry which resulted in an emotional strain and superimposed upon a preexisting mental condition resulted in the claimant's disability.
>
> "It may logically be argued that claimant here is just as disabled as someone suffering from a physical disability. This we do not dispute but it does not, at present, constitute *an accident as defined by the Workmen's Compensation Law*. It is not within our province to decide otherwise." Chernin v. Progress Service Co., 9 A.D.2d 170, 172, 192 N.Y.S.2d 758, 760. (Emphasis supplied.)

In Nebraska, whose statute requires violence to the physical structure of the body, compensation was denied to an elevator operator for shock occasioned by seeing a passenger killed. Bekeleski v. O. E. Neal Co., 141 Neb. 657, 4 N.W.2d 741.

In Texas, however, where an injury is defined as damage or harm to the physical structure of the body, compensation was allowed a structural steel and iron worker whose anxiety state, which prevented him from doing his regular work, was precipitated by a "psychic trauma," viz., fright occasioned by the collapse of a scaffold, eight stories up, from which his co-worker thereon fell to his death. The court said damage to the nervous system constituted damage to the physical structure of his body, since the physical structure no longer functioned properly due to the nervous system disorder. Bailey v. American General Insurance Co., 154 Tex. 430, 79 S.W.2d 315. In any event, neither the Nebraska case nor the Texas case turned on the *cause* of the damage to the nervous system. Both were primarily concerned with the result, due to their peculiar statutory definitions. In the Texas case, however, that a mental stimulus caused the disability was not considered a bar, and that is the significant point with respect to the case at hand.

This was true as well in West Virginia in 1935. A miner became lost, and remained alone in the mine until found seven days later. For several weeks thereafter he couldn't return to work as a result of shock and exhaustion. Compensation was affirmed in Montgomery v. State Compensation Commissioner, 116 W.Va. 44, 178 S.E. 425.

Another case with a purely nonphysical impact stimulus involved a young lady who was frightened by the flash from a short circuited motor and fainted. She returned to work, but some weeks later when she saw the fellow worker who had caught her when she first fainted, she fainted again. She could not thereafter return to work because of this neurosis, and an award of compensation was affirmed, notwithstanding the fact that she was merely frightened without physical contact or harm. Burlington Mills Corp. v. Hagood, 177 Va.204, 13 S.E.2d 291.

There is Michigan precedent also, long-established precedent at that. It was in January of 1920 that Otto Klein died. Just a few weeks earlier he had let a piece of machinery slip from his hands. It fell to the floor below, striking a fellow employee. Though the injury to his coworker was not serious, Otto Klein thought he had caused his death. The mental and nervous shock caused by this accident to his fellow employee, at his hands, resulted in a neurotic condition, causing Mr. Klein's death. His injury and death were held compensable notwithstanding that (as this Court said in LaVeck v. Parke, Davis & Co., 190 Mich. 604, 605, 157 N.W. 72, L.R.A. 1916D, 1277) no "visible accident occurred and no event causing external violence to applicant's body" occurred. Klein v. Len H. Darling Co., supra. The philosophy expressed by Justice Weist, concurring, is worth repeating here [217 Mich. 485, 187 N.W. 403]:

> "At first I was inclined to disagree with

Mr. Justice Moore, but upon reflection I am convinced he is right. An accident happened in which the deceased was an actor, and the shock to him was so acute and so depressed his vital forces as to kill him. We must not overlook man's nervous system and mental makeup and their intimate relation to his vital forces.

"This man died because his vital forces could not meet and withstand the acute depression occasioned by what he had done in the course of his employment. The injury to him was no less real and fatal in its consequences than a mortal wound. 'Accidents,' within the comprehension of the workmen's compensation law, include all accidents actionable at law and all former nonactionable accidents, except in case of intentional and willful misconduct on the part of the employee."

In 1943, in Rainko v. Webster-Eisenlohr, Inc., 306 Mich. 328, 10 N.W.2d 903, this Court said that it is not necessary to establish physical injury resulting in outward evidence of violence or trauma to justify an award of compensation. Plaintiff was one of 30 women victims of "mass hysteria" caused by an odor from gasoline vapor of less than toxic concentration in the area where the women worked in a cigar factory. The women collapsed, one after another, and plaintiff was left with dizzy spells, nausea, rash, hyperactive reflexes, an epigastric tenderness, anemia, and loss of weight. The court sustained an award.

This Court's most recent statement respecting compensability of a neurotic condition may be found in Redfern v. Sparks-Withington Co., supra, 353 Mich. at page 299, 91 N.W.2d at page 518:

"In this State, the rule is well established by a line of authority dating from 1922 that where occupationally-incurred injury to the body and/or shock to the nervous system produces a neurosis resulting in disability or death, it is compensable."

In Redfern, plaintiff while at work was struck on the back by a steel weight and was thereafter disabled from working by what the medical witnesses described as "conversion hysteria." There was no organic cause for her loss of feeling and strength in her right hand and arm, swelling and pain in the right shoulder and neck area, and fatigue. Compensation was allowed.

It would be well to note that, in the case at bar, although there was no evidence of psychosis prior to October, 1956, the expert testimony did indicate that plaintiff had a personality disorder all his life and that he had a predisposition to the development of a schizophrenic process.

There was also evidence that the plaintiff had been examined in the emergency room of the Highland Park General Hospital four days before the last day he worked, and that his condition at that time was described as "bronchial asthma and anxiety." An exhibit submitted by the defendant was a report from a doctor examining the claimant just prior to October 24, 1956, wherein Mr. Carter was advised to take a leave of absence for two or more weeks because of a severe state of anxiety and tension. It would appear, therefore, that the series of events in the instant case served to aggravate a pre-existing latent mental disturbance. That such is not a bar to compensation may best be pointed out by quoting from the Court's opinion in Karwacki v. General Motors Corporation, supra, from pages 356 and 357 of 293 Mich., at page 328 of 292 N.W.:

"The testimony . . . supports the finding of the department that the accidental injury aggravated a pre-existing latent mental disturbance, resulting in a disabling condition. The result is comparable to situations wherein an accidental injury has aggravated and precipitated a pre-existing latent physical ailment, resulting in disability. Awards of compensation in such cases have been sustained in a multitude of instances."

Appellant contends that there was no single event which precipitated plaintiff's psychotic breakdown and that, therefore, there can be no award of compensation under part 2 of the act. Appellant recognizes that for an award under part 2, no longer is it necessary to find an "accident" or a fortuitous event, citing Sheppard v. Michigan National Bank, supra, and Coombe v. Penegor, supra, but appellant further states that it appears from these cases that part 2 applies only to single event injuries. However, it does not appear from the Sheppard and Coombe cases that injuries not attributable to a single event are not covered by part 2.

This Court in the past has sustained an award of compensation under part 2 where the physical injury was not occasioned by a single event. In La Veck v. Parke, Davis & Co., 190 Mich. 604, 157 N.W. 72, L.R.A. 1916D, 1277, the plaintiff's paralysis was attributed to a cerebral hemorrhage caused by prolonged work in a heated kitchen. In affirming an award, the Court said, 190 Mich. at page 610, 157 N.W. at page 74:

"According to the testimony of some of the physicians that result could be traced to the unusual hours of work and the unusual conditions. It was an unexpected consequence from *the continued work in the excessively warm room.*" (Emphasis supplied.)

Further, to relegate the applicability of part 2 solely to single event injuries, would be to ignore express statutory language referring to multiple event injuries. Section 1 of part 2 provides for a " 'date of injury' . . . in the case of an injury not attributable to a single event," evidencing a legislative intent that such injuries should be compensable.

The case at bar involves a series of mental stimuli or events — (the pressure of his job and the pressure of his foreman) — which caused an injury or disability under the act, causal connection in fact having been found by the board, supported by competent evidence. We find further that Mr. Carter's disabling psychosis resulting from emotional pressures encountered by him daily in his work is compensable under part 2 of the act. Such conclusion renders unnecessary any discussion of the applicability of part 7 to the facts of this case.

Appellant further contests the portion of the appeal board's order awarding continuing compensation based on its finding of a continuing disability. The existence or extent of an injury or disability is a finding of fact and will not be disturbed where supported by competent evidence. Finch v. Ford Motor Co., 321 Mich. 469, 32 N.W.2d 712; Walding v. General Motors Corp., 352 Mich. 372, 89 N.W.2d 537. The testimony of the only medical witness was to the effect that the plaintiff could be employed again, but not on this same type of job, where it is necessary to keep up with a production line.

If there were testimony that claimant's inability to work on a production line was caused by the paranoid schizophrenia condition for which we have held he is entitled to compensation benefits, he would be entitled to continuing payment of such benefits. However, Dr. Tourkow testified that as of September 11, 1957, Mr. Carter no longer showed any symptoms of paranoid schizophrenia or other psychosis. He testified that Mr. Carter should not be employed again in production work, not because of his paranoid schizophrenia, but for the same reason he should not have been employed in such work in the first place: Mr. Carter has a personality configuration that makes him more susceptible than others to psychotic breakdowns when subjected to pressures such as are encountered in production line employment. Under the circumstances, we find no evidence to support the appeal board's award continuing compensation benefits beyond September 11, 1957.

The order of the appeal board should have terminated payment of benefits to Mr. Carter on September 11, 1957, and upon remand to the appeal board it shall be so modified. In all other respects the order is affirmed. No costs.

Dissenting Opinions

Kelly, Justice (dissenting): Justice Souris affirms the workmen's compensation appeal board under part 2 of the act, and states: "Such conclusion renders unnecessary and discussion of the applicability of part 7 to the facts of this case."

James H. McLaughlin, chairman of the workmen's compensation appeal board, found that defendant's foreman was "riding" and "wrangling" with plaintiff, and that plaintiff was entitled to receive compensation under part 7 of the act, stating:

> "Plaintiff sustained a personal injury arising out of and in the course of employment and due to causes and conditions characteristic of and peculiar to the business of his employer. The conditions of plaintiff's employment involved a hazard greater and different from that to which the public is generally exposed."

Commissioner Storie decided plaintiff was entitled to an award under part 2 and repudiated chairman McLaughlin's finding under part 7, stating:

> "Such finding by Chairman McLaughlin was predicated to a large extent on conditions which he finds were created by the 'wrangling' between the foreman and the plaintiff. I do not agree with Chairman McLaughlin. . . .
>
> "The tempo of the burring job was faster than plaintiff had been accustomed, however, when weighed in the light of employment in general I must conclude as did Member Ryan that there was nothing about the burring job which could be said to create causes and conditions which were characteristic of and peculiar to the business of the defendant employer. . . . Compared to employment in general within manufacturing establishments this was a relatively simple task that required no unusual lifting, turning or twisting. When weighed in the test of involving a hazard greater and different from that to be found in employment in general then a holding of causes and conditions characteristic of and peculiar to this employer's business must fail. Since there is no showing that there were 'causes and conditions characteristic of and peculiar to the business of the employer' I hold plaintiff's claim is not compensable under the provisions of part 7 of the workmen's compensation act."

Commissioner Ryan in his opinion stated:

> "The plaintiff's medical testimony indicates that he has had, for many years, a

personality predisposition to the development of a schizophrenic psychosis. He started working on the job in question on October 12, 1956. It was an ordinary job. There was nothing about it that presented any special or distinguishing hazard of mental strain. The difficulty that developed grew out of his refusal to comply with specific and reasonable instructions from his foreman. He felt that he could do the work faster by doing it in his way although the record does not indicate why his way would be faster. His psychosis commenced on about the fifth day with the complete breakdown following on about the tenth day. It clearly was related by way of precipitation to his feeling that he could not keep up his work and follow instructions.

"Chairman McLaughlin grants compensation under part 7. Section 1 of that part defines personal injury to 'include a disease or disability which is due to causes and conditions which are characteristic of and peculiar to the business of the employer and which arises out of and in the course of the employment. . . .'

"The accepted test of compensability under part 7 has been whether or not the conditions of employment result in a hazard which distinguishes it in character from the general run of occupations. . . .

"In this case there was no special or distinguishing hazard or anything out of the ordinary in the way of duty-risk insofar as the plaintiff's job was concerned. All that emanated from the job was the giving of simple instructions by the foreman to the plaintiff for the performance of a simple job. I do not agree that the plaintiff's disability is due to causes and conditions characteristic of and peculiar to the defendant's business.

"Member Storie grants compensation under part 2. He is in accord with me in finding that the plaintiff's disability is not due to causes and conditions characteristic of and peculiar to the business of the employer but he grants compensation under part 2 with the finding that the disability arose out of and in the course of the employment. I disagree with the latter finding. I do not believe that the injury arose out of the employment. . . .

"I do not believe that the plaintiff's disability arose out of his employment because of the total picture presented by the following considerations:

"There is nothing in this case identifiable as an occupational risk.

"The job was a simple job and the foreman's instructions were even simpler. Nothing more emanated from the employment.

"The disability arose out of the plaintiff's own feelings and misapprehension and from within himself completely. . . .

"Nevertheless, compensation is being granted and a more extreme case is not apt to be encountered. I do not believe that workmen's compensation was ever intended to cover this kind of a situation."

Defendant's position is set forth in its brief as follows:

"It would seem to us that if the plaintiff is to recover in this case he would have to meet the requirements of part 7. There is no one thing or event which is claimed in this case. This can be seen from the testimony and from the application for compensation. . . .

"The testimony does not indicate that plaintiff's disability is due to causes and conditions peculiar to his employment. His disability is due to and arises out of his mental condition. . . .

"The plaintiff's job was a simple one, and the instructions were simple also. There was no special and distinguishing hazard on plaintiff's job. It is very apparent that the plaintiff had a very unrealistic attitude towards his job due to his personality disorder. We do not think that there should be liability in cases where an employee by reason of his delusions, should feel trapped or feel insecure in his job. This could lead to liability in cases where the disability results from conditions which are built up in the mind of the employee. An employee might brood over not getting a raise, feeling that his boss did not like him, and could get compensation despite the fact that this may not be the true situation.

"We also contend that the workmen's compensation appeal board by majority opinion has made a finding of fact in this case that there is no liability under part 7.

"Under section 12, part 3, of the workmen's compensation law (M.S.A. 17.186), such findings of fact are conclusive. . . .

"Liability under part 2, which is found by Member Storie, seems to be based on the premise that the unusual result of the occupation is an injury under part 2. We would say that the unusual result, if there is one, would be caused by the condition of plaintiff's mind and not by his occupation. We say again, however, that there being no single event alleged or found by the

workmen's compensation appeal board that part 2 does not apply. Plaintiff's claim is predicated entirely on the conditions of his job. An injury under either part 2 or part 7 must arise out of and in the course of the employment."

Part 7, § 1, subd. c (C.L.1948, § 417.1 [Stat. Ann.1950 Rev. § 17.220], reads:

"The term 'personal injury' shall include a disease or disability which is due to causes and conditions which are characteristic of and peculiar to the business of the employer and which arises out of and in the course of the employment. Ordinary diseases of life to which the public is generally exposed outside of the employment shall not be compensable: Provided, however, that a hernia to be compensable must be clearly recent in origin and result from a strain arising out of and in the course of the employment and promptly reported to the employer."

Justice Souris refers to decisions from Michigan and from other jurisdictions to sustain his opinion. An analysis of these cited cases discloses that while they sustain the compensability of emotional disability, in each instance there was some precipitating factor as disclosed by the following:

Plaintiff's husband's death resulted from shock caused by dropping an object on a fellow employee, knocking said fellow employee unconscious (Klein v. Len H. Darling Co., 217 Mich. 485, 187 N.W. 400); plaintiff became emotionally disabled after a piece of hot metal entered his glove (Karwacki v. General Motors Corp., 293 Mich. 355, 292 N.W. 328); plaintiff, after suffering the loss of an eye by an occupational injury, developed a post-traumatic neurosis and was unable to work (Hayes v. Detroit Steel Casting Co., 328 Mich. 609, 44 N.W.2d 190); plaintiff was injured when a 15 to 20 pound steel weight struck her between her shoulder blades and she subsequently suffered conversion hysteria (Redfern v. Sparks-Withington Co., 353 Mich. 286, 91 N.W.2d 516); plaintiff and 30 other employees suffered mass hysteria caused by an odor of gasoline vapor, after which plaintiff was unable to work because of dizziness (Rainko v. Webster-Eisenlohr, Inc., 306 Mich. 328, 10 N.W.2d 903); plaintiff's husband died from shock and excitement and overexertion in attempting to pull a fire from a boiler in order to prevent an explosion (Monk v. Charcoal Iron Co., 246 Mich. 193, 224 N.W. 354); plaintiff tried to lift a 25 pound tray of cards and suffered an injury when she attempted to yank it free (Sheppard v. Michigan National Bank, 348 Mich. 577, 83 N.W.2d 614); plaintiff suffered an injury when he exerted great effort to tighten a load binder (Coombe v. Penegor, 348 Mich. 635, 83 N.W.2d 603).

The final Michigan case cited by Mr. Justice Souris — La Veck v. Parke, Davis & Co., 190 Mich. 604, 157 N.W. 72, L.R.A. 1916D, 1277, is the only case where there was not an overt act or a direct physical injury leading to neurosis. In this case claimant was awarded compensation for a cerebral hemorrhage induced by heat and overexertion. The court held that since evidence that tends to sustain a determination of the Industrial Accident Board is not subject to review, in appellate proceedings, on writ of certiorari to review the award of compensation for paralysis that resulted from heat and excessive exertion rupturing a small blood vessel of the brain (claimant having suffered from arteriosclerosis for two years prior to his injury), the question whether it was caused by an accident arising out of or in the course of claimant's employment was for the lower tribunal and would not be reversed unless a total lack of evidence upon that issue was disclosed.

Justice Souris cites four decisions from other jurisdictions to sustain his opinion, and the following briefing of the facts in those cases, I believe, discloses they are dissimilar to the facts in our present appeal. Plaintiff-claimant's fellow worker fell off a scaffold to his death and plaintiff, who was almost killed, was subsequently unable to work at heights (Bailey v. American General Ins. Co., 154 Tex. 430, 279 S.W.2d 315); plaintiff suffered a traumatic neurosis and could no longer work, her neurosis being caused from fright when a short circuit from a motor caused a flash (Burlington Mills Corp. v. Hagood, 177 Va. 204, 13 S.E.2d 291); plaintiff suffered paralysis caused solely from fright when lightning struck the building and blew out three motors near a machine at which she was sitting (Charon's Case, 321 Mass. 694, 75 N.E.2d 511).

The final of the four out-state decisions Justice Souris cites (Montgomery v. State Compensation Commissioner, 116 W. Va. 44, 178 S.E. 425) dealt with a miner who became lost in a mine and thereafter suffered shock and exhaustion. In granting compensation the West Virginia court stated (116 W.Va. at pages 46, 47, 178 S.E. at page 426):

"It is clear that the term 'personal injury' as used in the Workmen's Compensation Act . . . of this state contemplates and includes the result of unusual exposure, shock, exhaustion, and other conditions not of traumatic origin, provided that they are attributable to a specific and definite event arising in the course of, and resulting from, the employment. We think therefore that the condition in which Montgomery found

himself as a consequence of getting lost in the mine is an injury within the meaning of the Compensation Act, inasmuch as it is attributable to a specific and definite event."

Justice Souris, after stating that:

"What distinguishes the case at bar from our other decisions which recognize the compensability of such disabilities is that this plaintiff's disability was caused by neither a single *physical* injury to plaintiff nor by a single mental shock to him. Instead, his disability was caused by emotional pressures produced by production line employment not shown by him to be unusual in any respect, — that is, not shown by him to be any different from the emotional pressures encountered by his fellow workers in similar employment. As noted above, the finding of causal relationship between plaintiff's disability and the pressures of his employment was supported by the evidence. The question then becomes, must industry, under our laws, bear the economic burden of such disability?"

answers the question by saying:

"We make no claim that it is universally held that a mental disorder which is precipitated solely by a mental stimulus, as opposed to a physical impact, is considered a compensable personal injury. There are those jurisdictions in which no nervous disorder is compensable."

and he cites and briefly quotes from Indiana, New Jersey and New York decisions.

I quote more completely from the Indiana and New York decisions. In McGill Manufacturing Company, Inc. v. Dodd, 116 Ind.App. 66, 59 N.E.2d 899, it was held (Syllabi):

"A condition diagnosed as spastica torticollis, commonly known as wryneck, and which was a neurosis, was not incidental to the work of claimant who was engaged in operating a bore grinding machine, for a neurosis is an ailment to which the general public is exposed outside such employment. . . .

"The Occupational Diseases Act was not intended to provide general health insurance to the workman, but to compensate him for disability resulting only from a disease incidental to the character of the business in which he is employed and having its origin in a risk connected with the employment, and to exclude from the protection of the act workmen suffering from diseases arising out of a hazard to which workmen would have been equally exposed outside their employment and independent of the relation of employer and employee.

"The Occupational Diseases Act does not extend its protection to those workmen who suffer from outward manifestations and symptoms of many possible vagaries and aberrations of the human mind which, although having some causal connection with an employment are, nevertheless, ills all human flesh is heir to, unless, in such cases, the causative inducing the mental condition be an intervening occupational disease, as defined by the act."

In Chernin v. Progress Service Co., 9 A.D.2d 170, 192 N.Y.S.2d 758, a cab driver hit a pedestrian but did not suffer any physical injury to himself. However, he suffered a mental disorder and sought compensation. The New York court held (9 A.D.2d at page 172, 192 N.Y.S.2d at page 760):

"The question here is novel as it apparently has not heretofore been decided by the courts. Larson on Workmen's Compensation Law has little text on the subject but cites a New Jersey case, Voss v. Prudential Ins. Co. of America, 187 A. 334, 14 N.J.Misc. 791, where a stenographer was called an 'idiot' by a co-worker, became upset thereby and subsequently was treated for a nervous spell. That court determined there was no accident arising out of and in the course of her employment.

"While it may accurately be claimed the facts would be sufficient to sustain the Board if the injury were of a physical nature, we find the present facts not compensable under the law. Heart cases come closest to the present situation where a pre-existing condition was aggravated but there has always been a physical reaction — damage to the heart — as distinguished from mental. Furthermore, the rule in heart cases has been extended with great liberality, but the happening of some external event in connection with the work and causing the heart condition has been required. Lesnik v. National Carloading Corp., 285 App.Div. 649, 651, 140 N.Y.S.2d 907, affirmed 309 N.Y. 958, 132 N.E.2d 326.

"We find nothing in the law that connotes purely excessive emotions — anger, grief or other mental feelings — unaccompanied by physical force or exertion can be the basis of an accident. The record here discloses that claimant became angry which resulted in an emotional strain and superimposed upon a pre-existing mental condition resulted in the claimant's disability.

"It may logically be argued that claimant here is just as disabled as someone suffering

from a physical disability. This we do not dispute but it does not, at present, constitute an accident as defined by the Workmen's Compensation Law. It is not within our province to decide otherwise.

"The Board in their memorandum decision conceded there was no 'physical hurt' but the findings conclude he became emotionally disturbed as the result of questions by the police and that due to the emotional episode and psychological trauma he sustained an exaggeration of a pre-existing emotional disorder which resulted in schizophrenia, paranoid type.

"For the reason herein stated, the finding of the Board that it was an accidental injury within the provisions of the Workmen's Compensation Law should be reversed and the claim dismissed."

Justice Souris refers to Klein v. Len H. Darling Co., supra, as Michigan precedent and quotes the concurring opinion of Justice Wiest. The following sentence in Justice Wiest's opinion (217 Mich. at page 495, 187 N.W. at page 403) clearly distinguishes the Klein case from our present appeal:

"An accident happened in which the deceased was an actor, and the shock to him was so acute and so depressed his vital forces as to kill him."

Karwacki v. General Motors Corp., supra, is cited to establish that "a pre-existing latent mental disturbance" is not a bar to compensation, but the Karwacki case is not similar to the instant case as is disclosed by the following statement in the opinion:

"The testimony . . . supports the finding of the department that the accidental injury aggravated a pre-existing latent mental disturbance, resulting in a disabling condition."

In deciding this appeal we cannot forget the fact that a majority of the commission found there was no accident and plaintiff, while performing a simple job comparable to others employed, suffered a mental breakdown because he could not adequately perform that simple job.

Sheppard v. Michigan National Bank and Coombe v. Penegor, supra, are majored in Justice Souris' opinion with the statement that it does not appear "that injuries not attributable to a single event are not covered by part 2." I do not believe either of these cases is of compelling weight, because in both cases there was a single precipitating event and in neither case did we have a plaintiff that possessed such a mentality as to cause him to lose all control of himself without any accidental or unusual event.

Redfern v. Sparks-Withington Co., supra, is referred to as this Court's most recent statement respecting compensability of a neurotic condition. Suffice to say, in a five to three decision we held that a neurosis developing from an injury is compensable if directly caused thereby and not collateral thereto. There was no injury or comparable facts in this present appeal.

Defendant submits two questions in its statement of questions involved:

"1. Is the plaintiff's disability the result of a personal injury arising out of and in the course of his employment under either part 2 or part 7 of the Michigan workmen's compensation law?"

My answer to question No. 1 is "No."

"2. Is there any competent evidence in the record to sustain the finding of the workmen's compensation appeal board that the plaintiff is entitled to continuing compensation?"

The hearing referee (James A. Broderick) found "that said defendant pay compensation at the rate of $36 per week for total disability to said employee from October 24, 1956, to January 7, 1957, inclusive; and, that said defendant shall reimburse said employee $863.27 for medical and hospital care."

Appellee's position on this point is set forth in his brief as follows:

"The undisputed medical testimony accepted by the appeal board relative to disability was presented by the treating physician, Dr. Tourkow: Plaintiff should not be employed on a job which is highly competitive. He should be placed upon a job where he would have to maintain a certain rate of production. He certainly would not be employable in piece work. The type of job that Dr. Tourkow felt that the plaintiff would be able to handle would be a job where he would be able to function at his own level of production without having to push himself. Dr. Tourkow testified that plaintiff was well motivated toward working; that plaintiff actually wanted to work but that he would advise very strongly against anything which would resemble the competitive situation which produced plaintiff's psychotic break. . . .

"The plaintiff has been able to do a certain amount of casual farm labor, but that is a far cry from a competitive production-line job. Because of the very nature of plaintiff's disability, the plaintiff himself is incapable of making a reliable judgment as to his own capacity. . . .

"The plaintiff's right to compensation for a disability does not depend upon his being totally disabled from doing any work

but on his being disabled from earning full wages in the work in which he was last subjected to the conditions resulting in his disability. . . .

"The appeal board has made a finding of fact, a finding based on uncontradicted testimony. Defendant should not now be permitted to circumvent the appeal board's finding on this or any other factual issue."

The three members of the board filed lengthy opinions but only briefly referred to continuing disability.

Chairman McLaughlin found:

"Plaintiff contends that he did sustain such an injury and that he is entitled to compensation beyond January 7, 1957 and until further order of the department.

"We find as follows: Prior to October, 1956 plaintiff had a personality configuration which made him particularly susceptible to the development of a schizophrenic psychosis. Nevertheless plaintiff had suffered no mental breakdown and had not been out of touch with reality prior to October 24, 1956. There was no psychosis before such date. . . . The date of injury and date of disablement is October 24, 1956. As the result of the injury plaintiff has been totally disabled since October 24, 1956 from doing the work he was performing for defendant prior to that date. . . .

"The award of the hearing referee shall be modified to thus provide for continuing compensation from and after January 7, 1957, the date on which the referee stopped compensation."

Commissioner Storie stated:

"The record is void of any showing of other 'events' which could reasonably be held to have been the precipitating cause of plaintiff's disability. It is evident that this well qualified medical witness is of the opinion that the events created by and encountered during the course of the employment could have been 'the straw that breaks the camel's back' in the instant case. We then clearly have a disability and an unexpected result that arose out of and in the course of this employee's employment with defendant company. . . .

"From the proofs presented it would be mere speculation for us to hold that plaintiff would have been disabled because of the pre-existing condition even though he had not been employed by defendant company. There are no suggested reasons for plaintiff's mental breakdown other than those which did occur during the course of his employment. . . . Since plaintiff's capacity to earn cannot be measured against his incapacity the continuing award entered by the hearing referee is proper."

As hereinbefore noted, Commissioner Ryan found that plaintiff was not entitled to compensation.

Plaintiff's exhibit 1 was a statement of Dr. Warner to the president of Local 235, under date of January 29, 1957, in which he said:

"Mr. James Carter was hospitalized at St. Clair Hospital from 10-27-56 to 11-23-56. During his hospitalization he was treated for a nervous disorder which we have not been able to diagnose. He was given a thorough physical examination and was found to be in excellent condition. . . .

"Our last contact with him was on January 21, and he was physically fit to return to his employment."

Dr. Tourkow referred to the St. Clair Hospital diagnosis as follows:

"Well, actually, the diagnosis they arrived at at St. Clair Hospital, was paranoiac schizophrenia, and it certainly would be in keeping with these progressively developing feelings that the foreman was persecuting him, you see. Right now I don't see any evidence of paranoid schizophrenia per se. I do see some very minimal left over of a schizophrenic process, but really if you didn't know that the person had had this before, you wouldn't make a diagnosis solely on the symptoms. So this is why I used the term 'in remission' in my present diagnosis. In remission means that he's now not psychotic, he's not showing any symptoms right now."

The record discloses that plaintiff had this personality disorder all his life. He proved that he could not adjust to rules or regulations while in the army, but repeatedly went AWOL.

I agree with appellant's statement that: "The testimony does not indicate that plaintiff's disability is due to causes and conditions peculiar to his employment. His disability is due to and arises out of his mental condition." And, I also agree with appellant that the answer to its question No. 2 should be "No," and conclude that the decision of the workmen's compensation appeal board should be reversed.

Industrial physicians everywhere have joined in many enterprises seeking the industrial employment of persons handicapped from any cause. One deterrent to the employment of the handicapped is to be found in favorable awards of industrial compensation under circumstances such as attend the court decision here presented.

Science Miniature

Mercury Poisoning in Dentists

CAREY P. McCORD, M.D.

The hands of the dentist trembled noticeably as he went about his professional duties. As he mades notes it was easy to see that his handwriting had deteriorated toward illegibility. His own teeth had disappeared, but that may not have been a recent happening. The erstwhile affability had been replaced by an aloof reticence. He complained of various bodily pains that he termed "arthritis." From such a casual approach no diagnosis is warranted or made, but almost with certainty it may be concluded that this dentist is a victim of mercury poisoning.

The exposure that could lead to some mercury poisoning is not far afield. Some dentists who engage in metal fillings may be observed to engage in a dangerous practice. After the metals leading to the amalgam have been mixed mechanically, the mass, in varying sizes but approximating that of a peanut, reaches the dentist's worktable top. As a last step before its introduction, the dentist takes this metallic mass in one palm and with the thumb of the other hand presses out the excess of free mercury. With a toss of the hand this mercury in a thousand tiny globules is dashed onto the floor. This may go on a dozen times a day and sometimes six days of the week.

This mercury evaporates freely. A mass equal to the size of a peanut readily may provide mercury vapors sufficient to induce mercury poisoning, but the finer the globules, the readier the evaporation. The higher the temperature in the dentist's office, summer or winter, the higher the concentration of invisible mercury vapor.

Proof is lacking, but it may be surmised that over the land at all times some thousands of dentists are the victims of mercury poisoning in varying degrees of severity. All this appears to be unknown and not even suspected.

The prevention of this unwanted and wholly unnecessary disease as it occurs among dentists is obvious. The preparation of the amalgam should be completed as a mechanical operation. For some years and at the present time trainees in dentistry have been taught to make use of a mesh bag for the extrusion of the excess mercury from the amalgam. Such bags are either twisted or else a forceps is applied, leading to the mercury falling to a mortar below. Any contact with the hands is undesirable since the moisture of the skin serves to render the dental restoration less effective.

In the presence of a detected instance of mercury poisoning in a dentist's office, it is not sufficient merely to shift to the modern method of mercury expulsion. In addition the accumulation of mercury should be removed throughout the office not only by mechanical measures but by chemical treatment, several of which are effective and readily available.

Whenever the dentist resorts to the careless manual method of mercury elimination he is sowing the seed of almost inevitable consequential damage.

Books

A Physician's Introduction to Electronics — A Laboratory Manual

A. C. Morris, Jr., $2.50. Pp. 43. Pergamon Press, New York, 1961.

Hieroglyphics and electronic symbols seemingly are not intended to be understood by the uninitiated. Of the former, few physicians have need of knowledge but rarely today is the physician out of contact with the latter. For the purpose of permitting the physician to recall some of his basic physics and to learn something of electronic components and their functions, the author, associated with the Medical Division of the Oak Ridge Institute of Nuclear Studies, has prepared a small book which he terms a laboratory manual. The book may be used most effectively in conjunction with a demonstration set of electronic circuitry but much may be gained from the text with its graphic symbols and unit circuit illustrations.

The author first defines in language understandable to the physician a number of basic electronic terms, then presents a selection of electronic symbols, and finally by reference to the demonstration set explains briefly the functions of a number of electronic elements.

Full appreciation of the book requires amplification of the text by one familiar with electronics and preferably with the aid of the demonstration set, or by reference to a text listed by the author: *Electronics for Everyone* by Upton and Monroe, published by the New American Library, 1957, as a Signet Key Book, number KD351, priced at 50 cents. However, the physician can learn much on his own perusal of the book and enough to assist him better to communicate with electronically oriented people, a capacity which Marshall Brucer, M.D., suggests in his introduction to the book is essential to physicians using electronics equipment.

—WARREN A. COOK

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The Byssinosis Centennial

In 1861, Greenhow first described the perplexing disease, byssinosis, as it occurs among cotton workers. It is not known that this original report to the Privy Council in London was ever published in a form now readily available. In the ensuing years, but chiefly within recent years, numerous other publications on byssinosis have appeared in several countries. What is important and what justifies the recognition of this centennial is that now, 100 years later, the etiology of this occupational disease remains obscure. It is widely claimed but not precisely proved that a protein fraction in the cotton dust is contributory to the causation of the disease. It may well be that byssinosis is a form of allergy, but if so it is far from what might be termed a "standard" allergy. There are many peculiar features, such as the fact that it is so much in evidence on Mondays that it has been accorded the cant name of "Monday Disease."

Perhaps only by accident and without any planning to mark the centennial year of the first description of byssinosis, a group of Egyptian workers has made substantial contribution to the knowledge of that disease (Mostafa A. El Batawi, and Mahmound S. Abdel-Salam: "Byssinosis in the Cotton Industry of the Egyptian Region, U.A.R.," *The Alexandria Medical Journal* 7:355, July, 1961). A number of extracts derive from that publication:

> In a period of five to ten years after the first appearance of the Monday sickness the symptoms gradually become more apparent and tend to spread over all the working days of the week. The cough becomes of metallic character and the patient complains of easy fatigue and diminished capacity for work. In advanced stages, the dyspnoea increases and cough with mucopurulent expectoration becomes more persistent. The patient may lose sleep from nocturnal attacks of cough. Consequently he becomes completely disabled to perform any kind of work. If exposure to dust is ended in the early stages of the disease, it disappears completely and the patient recovers. In late stages, however, it is unlikely to get any improvement by interruption of exposure. Clinical examination in the early stages does not reveal objective signs apart from congestion of the throat and probably of the conjunctiva. Examination in the late stages reveals the classical signs of chronic bronchitis and emphysema. . . .
>
> Cotton dust is mainly composed of fibres and plant debris. It also has a variable con-

tent of husks, broken seeds and silicious matter. Prausnitz (1936) showed by chemical analysis of the dust, the presence of waxy material (0.8%), fatty and other alcohol soluble material (14.4%) and a protein fraction (4.5%). A mineral content of silicon dioxide, iron oxide, aluminum oxide, salts of magnesium, sodium and potassium was also found. . . .

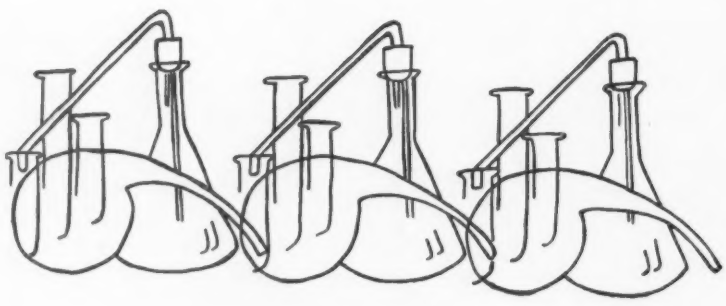
The dust is badly contaminated with micro-organisms, mainly bacteria and fungi. The bacterial and fungal content was studied by Furness and Maitland (1952). Gram positive cocci and bacilli, gram negative bacteria, moulds and hyphae of fungi were detected in their specimens. Among the aerobic bacteria the genus Bacillus predominated. These were not found to be pathogenic to guinea pigs. From the gram negative bacteria Achromobacter was found. Aerobic Actinomyces, Aspergillus, Penicillium as well as anaerobic Clostridium welchii type A and Cl. Histolyticum were also shown. . . .

A variable amount of histamine-like substance was detected by Prausnitz in certain extracts of dust. An amount of 0.012 mg. per 100 g. was found in cardroom dust where Egyptian cotton was used. It is believed by several authors that this histamine-like fraction is not responsible for the causation of allergic manifestations in byssinosis. Intradermal tests performed by Prausnitz (1936) and Cayton et al. (1952) produced similar reactions with byssinotics as well as with controls. The causative factor, however, is believed to be a protein of unknown nature that produces allergic manifestations. Besides, mechanical irritation of the fibres to the bronchioles and in the alveoli are, to some extent, still blamed for the symptoms (Schilling 1959).

In summary these Egyptian authors observe:

> A clinical investigation in the Cotton Pressing Plants in Alexandria has shown the high prevalence of byssinosis (52.5%) among the workers exposed to cotton dust by inhalation, particularly those engaged in pedal pressing of bales (70%). Different ratios were observed in different departments depending on the degree of dust exposure. The duration of exposure was found to have an influence on the stage of sickness and its severity. Other diseases of traumatic and endemic nature were observed among the workers in the different departments.

Among some occupational health workers there is wailing and wringing of hands that few opportunities for investigative work are obvious. Just the opposite is the true state of affairs and one of the opportunities is to establish beyond peradventure the exact cause of byssinosis. One hundred years have elapsed since that disease was first described. So far its exact causative agent has eluded many earnest investigators.



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COMMENT AND OPINION

Disability Days

During the year ending June 30, 1960, illness and injury caused the American people to stay home from work, stay in bed, or otherwise cut down their usual activities for an average of 16 days per person, including six days of bed disability, according to the Public Health Service.

These estimates come from the latest in a series of published statistical reports of the Service's National Health Survey. They apply to the civilian population of the country exclusive of persons confined to long-term institutions.

The figures are similar to those reported for the year ending June 30, 1959. However, estimates for both these years are well under the figures for the year ending June 30, 1958, which covered the period of the Asian influenza epidemic. During that year the average was 20 days of restricted activity, including eight days of bed disability.

The new report also shows that during the year ending June 30, 1960, more disability was experienced by women than by men. People over 45 had more disability days than did younger persons, with the rate increasing sharply with advancing age.

People who live in rural farm areas of the country reported more days of disability, on the average, than those living in urban and rural-nonfarm areas. Those in the lowest income groups reported the highest rates of disability, and the number of disability days dropped consistently with rising income.

Each One Reach One

Professional leaders can personally help to relieve this country's severe shortage of trained vocational rehabilitation workers, Mary E. Switzer, Director of the Office of Vocational Rehabilita-

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Medical Director: 36; well qual gen & ortho surg; sev yrs, sucessful private pract; 5 yrs, regional med dir foreign plant of amer co; inter in foreign assignmnt exclud Saudi Arabia, Iraq or W. Amer.

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Medical Director: Cert, occ med; Bd elig, int med; 5 yrs, phy in charge, lge plant, impor co; 3 yrs med dir heavy indus w/5000 empl; seeks oppor 75% adm, 25% cl.

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Medical Director: MPH, Harvard; Bd elig, occ med; extensive experience, as med dir, very impor co, heavy industry; and as chief PH, lge foreign countries; returng after 2 yrs import indus post, abroad; outstandg man w/impressive record of achievmnt; seeks indus or PH as chief, warmer climate.

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Staff: 29; now completg 2 yr occ fellowshp in indus med, leadg univ; Bd elig, indus med; DNB; seeks post, pref w/lrg indus, any loc; immed avail, mil serv filled.

Staff: Passed part 1, int med; 2 yrs, priv pract; past 2 yrs, asst med dir, lge natl co; seeks career, indus; any loc; late 30s.

Staff: 31; 3 yrs indus exper; now completg tour of duty, USAF; seeks post abroad w/US concern; yng, hard workg man w/drive.

Staff: 35; mil serv compltd; 4 yrs plant phy and 2 yrs med dir, lge regionl plant, leadg indus; seeks post w/oppor future & educatnl; pref MW, Pac-coast.

Staff: 32; mil serv completd; exc avia & prev med exper; 3 yrs priv pract exp; seeks indus post w/growth potentl; any loc; well trnd, speaks Germ, Dutch, Span.

Staff: 36; exc backgrnd in Gp & 3 yrs indus med; post grad wk in indus med leadg schl; seeks post w/future; pref Ohio, MW.

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tion, writes in the September-October issue of the official OVR magazine, *Rehabilitation Record*.

In her column, "The Open Door," Miss Switzer notes that some foreign countries have had great success in combatting illiteracy through an "Each-One-Teach-One" program, and suggests that an "Each-One-Reach-One" approach in the United States could recruit many young people into rehabilitation careers. As an indication of the size of the problem, the OVR director points to the need for 5,200 qualified physical therapists in addition to the 8,000 now in practice — with fewer than 700 a year currently being trained by the schools.

"We must begin in high school," she observes, "and pay particular attention to the disabled themselves who by their example and special motivation can bring more to a career in this field than others."

Techniques for rehabilitation of cerebral palsied adults, and of persons confined to their homes by disability, are presented in two special sections of the issue. The first deals with problems confronting the cerebral palsied from childhood to job-seeking days, and the second outlines the growing Federal-State effort to provide services to the homebound, including students faced with interrupted educations, rural shut-ins, ailing older persons, and other hitherto neglected groups. An example of how such programs result in benefits to society as a whole, beyond the benefits to the disabled themselves, is provided by Hawaii's garment industry, in which it was found that the wasteful practice of having highly paid cutters and power machine operators leave their machines to produce handmade buttons was unnecessary. Blind workers could be trained to make the buttons at home, as one article shows.

Advances in medicine are creating new and greater vocational rehabilitation needs, Dr. Donald Covalt, Professor of Physical Medicine and Rehabilitation at New York University School of Medicine, observes in an article offering "Some Medical Forecasts." This increase in rehabilitation problems, he explains, will result largely from growth in the proportion of aged persons in the population as medical science devises methods for preventing, anticipating, and successfully treating heart attacks, strokes, certain types of cancer, and other diseases which formerly caused people to die at earlier ages. Dr. Covalt urges intensified rehabilitation education for practicing physicians, and, like Miss Switzer, calls on leaders of the profession to enlist young people in physical medicine and rehabilitation specialties.

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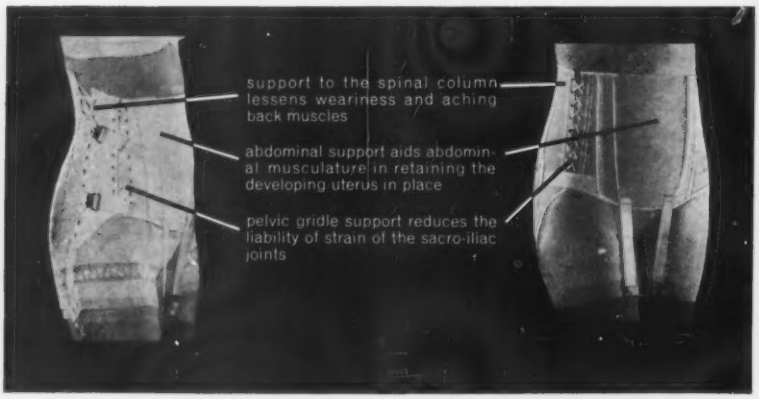
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The data sheet describes boron hydrides — diborane, pentaborane and decaborane — as highly flammable materials with wide combustion limits and warns that their mixtures with oxidizers can be explosive.

SD-84 points out that these chemicals are "highly toxic and because they may impair the sense of smell, odor cannot be relied upon as a means of detection." It emphasizes that adequate respiratory protection must be provided for all who may be subject to exposure.

The data sheet details the properties, hazards, engineering control of hazards, employee safety, fire fighting practices, handling and storage, tank and equipment cleaning and repairs, waste disposal, medical management and first-aid treatment relative to the boron hydrides.

SD-84 is available from the Association, 1825 Connecticut Ave., N. W., Washington 9, D. C., for 30 cents a copy.

The Flu Is Coming

The Public Health Service has announced that very little influenza has as yet been reported around the nation and has emphasized the importance of using available supplies of influenza vaccine to immunize persons in the high risk groups before the onset of winter.

Groups to whom vaccination is most important are persons of any age who suffer from chronic diseases of the heart, lungs and circulatory system; pregnant women, and persons over 65 years of age. Between September, 1957, and March, 1960, persons in these three groups accounted for most of the 86,000 influenza-related deaths.

While the vaccine has been in short supply in many areas in recent weeks, the Service anticipates that there will be ample supplies to immunize the high risk groups before the end of the year. In times of short supply, this protection may be limited to only one injection since it is the first shot that gives most immunity. Until supplies become ample, vaccine should be limited to the high risk groups.

Vaccine manufacturers have produced more influenza vaccine during the past three months than in the preceding twelve-month period. They have been asked by the Service to employ all feasible means to expedite delivery of new vaccine shipments, exercising the usual precautions for the purity and safety of the product.

Some increase in local outbreaks of two types of influenza, A and B, has been forecast by influenza experts for this season. This forecast is based on observed influenza cycles. Type A influenza tends to occur in two or three year cycles and has been dormant in this country since March, 1960. Type B influenza generally comes in four to six year cycles, and has not been prevalent in this country for more than six years. Both types were prevalent in various countries last year, notably in England and Japan.

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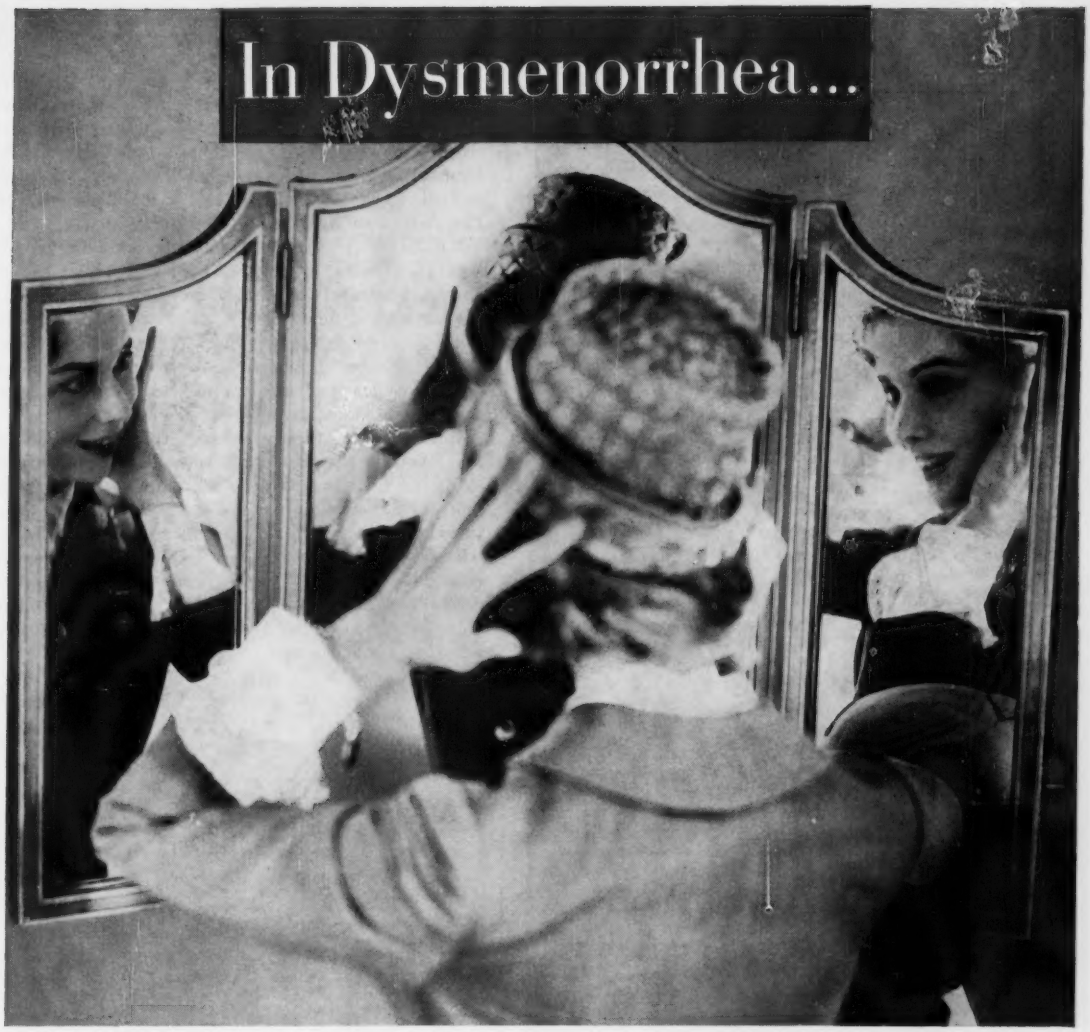

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PHASE I: Groups of Swiss mice received daily injections of Go-Jo Creme Hand Cleaner.[2] After seven days, body weights were recorded and the animals of one group sacrificed for gross pathology. The remaining animals received injections for three weeks and then were sacrificed and autopsied. The absence of mortality, weight loss, change in organ weights and gross pathology evidenced Go-Jo Creme Hand Cleaner's virtual freedom from systemic toxicity.

PHASE II: Albino rabbits were grouped and their flanks shaved. The experimental group was further divided, and the skin of one subgroup was abraded. For two weeks the subjects received daily applications of Go-Jo Creme Hand Cleaner. After a thirty-day observation period the animals were sacrificed and autopsied for gross pathology. Specimens of control and treated skin underwent histological examination for the appearance of pathological changes. The virtual absence of gross and microscopic pathology following prolonged topical application evidenced Go-Jo Creme Hand Cleaner's relative freedom from dermal toxicity.

The tests confirmed the virtual absence of subacute or chronic dermal or systemic toxicity and established the relative safety and freedom from toxic irritants of Go-Jo Creme Hand Cleaner.

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2. Cans of Go-Jo Creme Hand Cleaner were obtained from retail supplies and pooled. This pooled sample was used in all tests.

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MEDICO, Inc., and others are expected to take action soon which will formally associate them with the worldwide medical program.

The organizations that have, by formal action, become affiliated with MEDICO are The American College of Physicians, The American College of Surgeons, The American Psychiatric Association, The American College of Radiology, The American Academy of Physical Medicine and Rehabilitation, and The American Academy of Pediatrics.

MEDICO, Inc., the nonprofit, nonsectarian, private organization that was established in 1958 by Doctor Comanduras and the late Dr. Tom Dooley to bring the benefits of modern medical care to areas of the world where it is desperately lacking, has at present 17 projects being operated by teams of American physicians and nurses in 12 countries of Africa, Asia, Latin America, and the Near East.

Doctor Comanduras explained that formal affiliation of the specialty societies with MEDICO provides for their cooperation in program development and participation in overseas projects. It also gives them an opportunity to help recruit the physicians who volunteer to staff the MEDICO overseas projects. The specialists' organizations establish liaison committees and name physicians from their membership to serve on MEDICO's board or its medical advisory council.

Give
The UNITED Way

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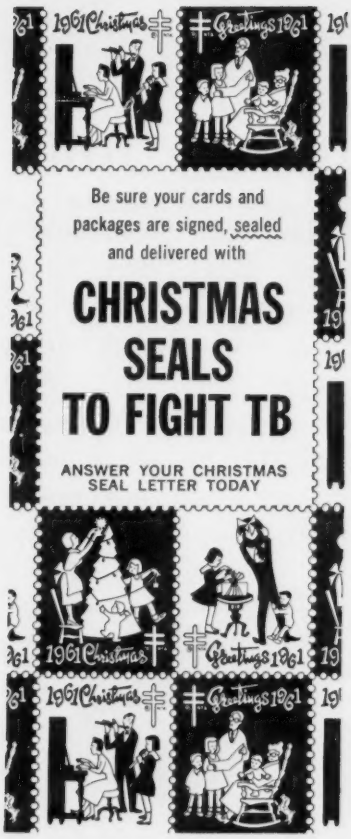

1961 Christmas
Greetings 1961
Be sure your cards and packages are signed, sealed and delivered with
CHRISTMAS SEALS TO FIGHT TB
ANSWER YOUR CHRISTMAS SEAL LETTER TODAY

OCCUPATIONAL HEALTH PHYSICIAN

Certified in Occupational Medicine by the American Board of Preventive Medicine or with acceptable equivalent qualifications including at least three years Occupational Medicine experience. To work as Occupational Medicine and Workmen's Compensation consultant to Medical Department of Company in the Middle East. Company provides medical care to employees and dependents (300 bed modern hospital, 60 physicians including specialists, 2000 employee admissions and 200,000 employee clinic visits annually).

Modern and pleasant family living facilities, excellent schools, interesting travel opportunities. Please send letter outlining personal history, education and experience, and including telephone number, to *P. O. Box #1433, New York 17, New York.*

When stomach discomfort slows productivity,

THEY'RE BACK ON THE JOB FAST

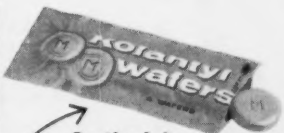
with . . . rapid-acting antacid combination

Kolantyl

Quickly soothes stomach distress

HEARTBURN • ACID INDIGESTION
UPSET STOMACH • OVERINDULGENCE

In the dispensary . . .
Kolantyl Gel
stops the discomfort plain antacids miss



On the job . . .
Handy new mint-flavored
Kolantyl wafers
a pleasant and practical approach to quick relief of stomach distress

Merrell · Since 1828

THE WM. S. MERRELL COMPANY • Division of Richardson-Merrell Inc. • CINCINNATI 15, OHIO

TRADEMARK: KOLANTYL®

PROFESSIONAL SAMPLE OFFER

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THE WM. S. MERRELL COMPANY
Division of Richardson-Merrell Inc.
CINCINNATI 15, OHIO

Please send me samples and product information:

☐ Kolantyl® ☐ Kolantyl Wafers

Name_____ RN

Company Address_____

City_____ Zone____ State_____

Coca-Cola, too, has its place in a well balanced diet. As a pure, wholesome drink, it provides a bit of quick energy.. brings you back refreshed after work or play. It contributes to good health by providing a pleasurable moment's pause from the pace of a busy day.

DRINK
Coca-Cola
TRADE-MARK

SKIN DISORDERS

RESPONSIVE TO TRIAMCINOLONE

"Triamcinolone has been shown to have more profound anti-inflammatory and antiallergic properties than preceding corticosteroids."*

■ enhanced anti-inflammatory, antipruritic, antiallergic effects ■ less gastrointestinal distress ■ may be of value when other corticoids have failed ■ virtually no mood changes, edema, sodium or water retention, or secondary hypertension

Supply: Scored tablets of 1 mg., 2 mg. and 4 mg. Syrup in 120 cc. bottles, each 5 cc. teaspoonful containing 5.1 mg. triamcinolone diacetate providing 4 mg. triamcinolone.

*Edelstein, A. J.: Pennsylvania M. J. 62:1831 (Dec.) 1959.

For full information, see your Squibb Product Reference or Product Brief.

Kenacort
Squibb Triamcinolone

SQUIBB
Squibb Quality—the Priceless Ingredient

'KENACORT'® IS A SQUIBB TRADEMARK.

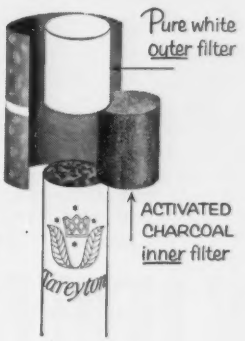
Pemphigus vulgaris

Tareyton delivers the flavor...

Here's one filter cigarette that's really different!

The difference is this: Tareyton's Dual Filter gives you a unique *inner* filter of ACTIVATED CHARCOAL, definitely proved to make the taste of a cigarette mild and smooth. It works together with a pure white *outer* filter—to balance the flavor elements in the smoke.

Tareyton delivers—and you enjoy—the best taste of the best tobaccos.



DUAL FILTER Tareyton

Product of The American Tobacco Company — "Tobacco is our middle name" © A. T. Co.

This is the highly accurate Tuberculin, Tine Test

Each unit contains one complete tuberculin test: a plastic holder with stainless steel disc and 4 tines coated with Old Tuberculin and dried. Except for cleaning the site with alcohol, no preparation, clean-up or other materials are needed. Reactions, read 48-72 hours later, can be readily identified and measured accurately. A series of tests* performed in tuberculosis hospitals confirmed the accuracy of the Tuberculin, Tine Test compared with the Mantoux. In one group of 942 Mantoux positives, 97.8 per cent were positive by the Tine Test. Among another group of 436 bacteriologically proven cases, 97.7 per cent were positive by the Mantoux Test and 97 per cent by the Tine Test. For industrial, school or community programs, the LEDERLE TUBERCULIN, TINE TEST offers distinct advantages in speed, accuracy and economy.

Supplied: Box of 25 test units.

*Russell, W. F., Jr.; Lynch, H. J.; Doto, I.; and Furcolow, M. L.; Comparison of Tuberculin Skin Reactions: Tine Test vs. Intracutaneous, Scientific Exhibit, 110th Annual Meeting, A.M.A., New York, June 26-30, 1961.

PULL...

PRESS...

DISCARD

The TINE TEST offers these advantages: ▪ Accuracy comparable to the Mantoux ▪ Adaptable to both mass testing and individual use in office practice ▪ Sterile, and disposable after one use—eliminating possible danger of cross-infection ▪ Easy to apply, permits uniform administration by auxiliary personnel ▪ Designed for rapidity, a physician and nurse team can test 25 individuals within two minutes ▪ Predetermined dose not subject to errors of measurement ▪ Multiple punctures help eliminate test failures, permit reactions to be read quantitatively ▪ Virtually painless, not frightening to children.

NEW LEDERLE TUBERCULIN, TINE TEST

(Rosenthal)

Request complete information on indications, dosage, precautions and contraindications from your Lederle representative or write to Medical Advisory Department.

LEDERLE LABORATORIES, A Division of American Cyanamid Company, Pearl River, New York

With PHENAPHEN 'ROBINS' for medical relief of pain—

"THE AMOUNT OF LOST TIME ...WAS GREATLY REDUCED"

*— reports this industrial physician**

In his recent on-the-job study of pain relief in industrial practice, Murray* observed that:

1. Phenaphen is more effective than a standard aspirin-phenacetin-caffeine formula for relief of moderate to severe pain . . .

2. Phenaphen is free from side effects despite its greater analgesic action . . .

3. Phenaphen is safe for machine operators since it is free from soporific effects, and thus permits returning to work or driving home with complete safety . . .

4. The superiority of Phenaphen is shown by the fact that "the amount of lost time . . . was greatly reduced."*

Formula: Each capsule contains:

Acetylsalicylic acid (2½ gr.)	162 mg.
Phenacetin (3 gr.)	194 mg.
Phenobarbital (¼ gr.)	16.2 mg.
Hyoscyamine sulfate (1/2000 gr.)	0.031 mg.

Dosage: One or two capsules as required. In industrial practice, Murray noted that "because of the complete absence of side effects, it is justifiable to increase the medication to two tablets every four hours."*

Supply: Bottles of 100 and 500 capsules.

*Dr. R. J. Murray, Medical Dept., Sperry Gyroscope Co., in an article published in the New York State Journal of Medicine, August 15, 1953 (Vol. 53, No. 16).

PHENAPHEN®

Robins

— superior analgesic for ambulant patients
*—"satisfactory for everyday industrial use"**

For more severe pain, Phenaphen is also available with varying dosages of codeine added to the basic formula, providing greater analgesia, free from the habituation hazards of addicting narcotics, as:

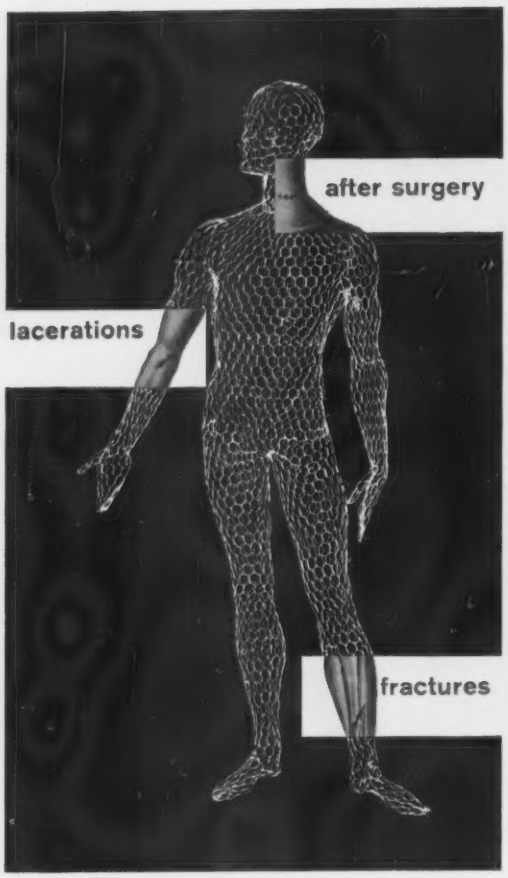
PHENAPHEN WITH CODEINE PHOSPHATE ¼ GR. *(Phenaphen No. 2)*

PHENAPHEN WITH CODEINE PHOSPHATE ½ GR. *(Phenaphen No. 3)*

PHENAPHEN WITH CODEINE PHOSPHATE 1 GR. *(Phenaphen No. 4)*

A. H. ROBINS CO., INC. • Richmond 20, Virginia

Ethical Pharmaceuticals of Merit since 1878



In Surgery: better results faster

Parenzyme®

(trypsin 'National')

- **reduces inflammation**
- **eases pain**
- **speeds healing**

Parenzyme Aqueous / Orenzyme® (oral tablets)

Composition: Parenzyme is purified crystallized trypsin for intramuscular use. **Orenzyme:** Each tablet contains trypsin 68%, chymotrypsin 30%, ribonuclease 2%, equivalent in proteolytic activity to 20 mg. of crystalline trypsin.

Side Effects: Parenzyme has a wide margin of safety and is rarely contraindicated. Toxic reactions following intramuscular use of Parenzyme are exceedingly rare. Although trypsin is a normal product of the human body, it is possible that sensitivity to it may be present or be produced by the administration of Parenzyme. The usual precautions should be observed as for the injection of any protein material, with sensitivity testing when indicated.

Parenzyme is compatible with all commonly used drugs, including antibiotics. In infection, appropriate antibiotic therapy should be used concurrently.

For complete details on indications, dosage, administration and side effects, see insert included with each package.

THE NATIONAL DRUG COMPANY
Division of Richardson-Merrell Inc.
Philadelphia 44, Pa.

7/61 P-2343/61-E

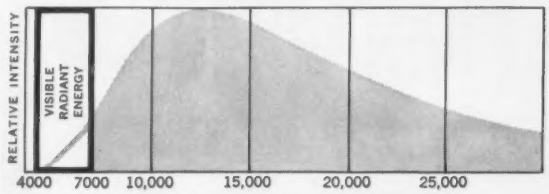
ANNOUNCING BURDICK'S NEW INFRARED LAMP

New ZOALITE 500 LAMP features long-range, retractable extension arm.

Radiant energy from the Z-500 Infrared lamp is in the spectral range capable of greater tissue penetration. Its special long-life quartz tube has almost ideal spectral characteristics for therapeutic infrared radiation. (See chart below.)

New equipoise arm permits positioning over widest treatment table. Unique counterbalanced construction holds lamp stationary. The Z-500 also has an Alzak aluminum reflector designed to project radiation evenly over the treatment area. Hot spots are eliminated.

the heart of the new Z-500 is its quartz infrared tube



RELATIVE SPECTRAL DISTRIBUTION IN ANGSTROM UNITS — BURDICK Z-500 LAMP

As will be noted from the above chart, most of its radiant energy is in the range which is capable of the greatest tissue penetration.

SEE THE NEW BURDICK Z-500 ON DISPLAY AT YOUR DEALER'S

Burdick

THE BURDICK CORPORATION
MILTON, WISCONSIN
Branch Offices: New York
Chicago • Atlanta • Los Angeles
Dealers in all principal cities

For allergy

For itch

Everyday practice report:

Following initial clinical investigational work, Forhistal was sent to physicians throughout the country for evaluation as an antiallergic and antipruritic agent in everyday practice. Results in 6181 cases have now been analyzed. In 3419 cases in which a comparison was made, Forhistal was judged better than previous therapy in 7 out of 10 patients. Information about the investigational work done previously is being mailed to you separately and is also available on request.

SUPPLIED: *Tablets*, 1 mg. (pale orange, scored). *Lontabs*, 2.5 mg. (orange). *Syrup* (pink), containing 1 mg. Forhistal maleate per 5-ml. teaspoon. *Pediatric Drops* (pink), containing 0.5 mg. Forhistal maleate per 0.6 ml.

For complete information about Forhistal (including dosage, cautions, and side effects), see Physicians' Desk Reference or write CIBA, Summit, N. J.

FORHISTAL® maleate (dimethpyrindene maleate CIBA)
LONTABS® (long-acting tablets CIBA)

new Forhistal® rated better than previous therapy in 7 cases out of 10

CIBA
SUMMIT, NEW JERSEY

2/2910MK-1

Calms the Tense, Nervous Patient

in anxiety and depression

The outstanding effectiveness and safety with which Miltown calms tension and nervousness has been clinically authenticated by thousands of physicians during the past six years. This, undoubtedly, is one reason why meprobamate is still the most widely prescribed tranquilizer in the world.

Its response is predictable. It will not produce unpleasant surprises for either the patient or the physician. Small wonder that many physicians have awarded Miltown the status of a proven, dependable friend.

Miltown®

meprobamate (Wallace)

Usual dosage: One or two 400 mg. tablets t.i.d.

Supplied: 400 mg. scored tablets, 200 mg. sugar-coated tablets; bottles of 50. Also as MEPROTABS® – 400 mg. *unmarked*, coated tablets; and in *sustained-release* capsules as MEPROSPAN®-400 and MEPROSPAN®-200 (containing respectively 400 mg. and 200 mg. meprobamate).

WALLACE LABORATORIES / *Cranbury, N. J.*

CM-5043

Clinically proven in over 750 published studies

1. Acts dependably – without causing ataxia or altering sexual function
2. Does not produce Parkinson-like symptoms, liver damage or agranulocytosis
3. Does not muddle the mind or affect normal behavior